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HEALTHY ENVIRONMENTS FOR CANADIANS

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PART I: OVERVIEW

Foreword

This review and analysis was prepared for the Health Promotion Directorate and the NHRDP Working Group on Priorities for Health Promotion/ Disease Prevention Research, of Health and Welfare Canada, under Articles of Agreement for Consulting and Professional Services dated May 4, 1987 between Her Majesty the Queen in right of Canada represented by the Minister of National Health and Welfare and Bruce M. Small and Associates Limited.

This document constitutes a comprehensive review of scientific and other literature, and of other research sources available to the contractor, in the area of healthy environments, addressing the question 'What is a healthy environment for people in Canada?'

> **Part I: Overview** represents the contractor's interpretations of the facts available and the contractor's recommendations to the Government of Canada for making healthy environments accessible to all Canadians, consistent with the Minister of Health's 'Health for All' initiative.
>
> **Part II: Analysis** represents the contractor's organization of the knowledge found in the literature and research review. No claim of completeness is made for each area of discussion, as the knowledge summarized is limited by the amount of research uncovered.
>
> **Part III: Annotated Bibliography** lists all relevant literature and research contacts uncovered during the review. Most of the entries are annotated with a summary or abstract of important information contained in the reference.
>
> **Part IV: Name and Subject Indexes** contains a full alphabetical listing of all principal authors referenced in Parts I and II, and all authors included in Part III. A detailed subject index is provided to all sections, so that readers can access material relevant to their field of interest directly. Page numbers in the index distinguish between Parts I,II and III.

The contractor takes full responsibility for the logic and accuracy of this review. The reader is cautioned, however, that Parts II and III make considerable reference to conclusions drawn by others in research, which we have carefully and critically selected, but not independently verified.

The views expressed herein are not necessarily those of the Department of National Health and Welfare.

Executive Summary

Physical and social environments have an important effect on the health and wellbeing of people in Canada. Although this connection has been known and documented for many years, the knowledge does not appear to have been widely applied within Canada's health care delivery systems and in the design of physical settings and social programs and institutions in Canada.

There are major health and safety issues to be addressed in virtually every physical setting in Canada - in homes, in schools, in the workplace, and in public places, including the natural environment. Creating building designs, operational procedures, building and maintenance materials, and other products that do not lead to polluted indoor air is a common priority in all settings, that would appear to lead to the greatest immediate health benefit.

Many people in Canada are stuck in physical settings and social conditions which are unhealthy for them. Poverty and unemployment, for example, are major contributors to ill health. In many cases, either overt or subtle forms of discrimination (devaluing of one group of people by another) are involved in confining an individual to unhealthy environments. Prejudices based on age, gender, family type, race and culture, illness or handicap, and orientation and lifestyle are still common in Canada. If healthy environments are to be available for everyone in Canada, we must begin on every level to treat each person, no matter what their characteristics, as a person of value. In particular, achieving equal status for women in Canada is essential.

Many of our common environments ignore the true range of physical and cultural differences among people in Canada, and are less accessible than they could be. Some of our specialized environments recognize our physical differences, but forget the rest of our human characteristics and needs, creating environments which may be safe, or accessible, but which are psychologically or socially unhealthy. A new vision of environmental choice and greater individual control over environment is needed.

Creating better environmental designs, eliminating personal and structural prejudices, and applying new knowledge about environmental health within Canada's health care systems, all require a much more detailed understanding of the true diversity of Canada's people, their social and psychological characteristics, their needs and goals, and their physical differences in vulnerability to different environmental stressors. Direct participation of individuals who will be affected by any physical design, social program, or social institution is required.

Research and development of emerging technologies which give detailed, quantified information on the effects of different environments on health will provide the scientific basis on which to proceed to design healthier environments in Canada. Creating healthy environments in Canada, and producing a new generation of safer, cleaner materials and products will enhance Canada's industrial and scientific reputation, and distinguish Canada's products and services from those of other countries in world markets.

1. Synthesis of the Literature Review

The following is a brief synthesis of the major conclusions arising from the literature and from ideas obtained by research contacts. A detailed analysis of research and other information on healthy environments is presented in Part II: "Analysis".

a) our physical environment can affect our health

Dangers in the physical environment contribute significantly to the risk of injury, ill health, or death, for many people in Canada. The physical environment contains some health or safety risks in virtually every Canadian setting: homes, schools, workplaces, and public environments, including natural environments.

b) indoor air pollution is a significant component of the risk

The contamination of indoor air by numerous chemical emissions represents a significant component of the overall risk to health posed by physical environmental factors. Indoor emission sources include industrial processes, building materials, furnishings, combustion devices, maintenance products, pest control substances, personal care or pleasure products and human metabolism.

c) pollutants in food, water, and outdoor air are also stressors

Trace-level contamination of food, drinking water and outdoor air, with a wide array of pollutants of varying toxicities, likewise presents a general chemical stress to which virtually everyone in Canada must adapt.

d) social and economic conditions can definitely affect health

Unemployment, poverty and financial stress, work pressures, family problems, prejudice and oppression, isolation, and lack of control over one's life are all examples of socio-economic conditions which can have an adverse effect on physical and mental health. Conditions previously thought of as merely unfortunate (at least by the fortunate) can be highly stressful and clearly have more health cost than has been commonly acknowledged.

e) there is a wide range of vulnerability in the population

Each individual is unique in his or her reactivity to physical environmental factors. The population contains a wide variety of people, ranging from those who can go about their lives with little or no effect from their immediate physical environment, to individuals who are severely impaired in their day-to-day functioning by one or more specific environmental factors. Any one individual may have a unique array of sensitivities - he or she may be quite insensitive to one factor while being very sensitive to another.

f) limits to adaption to changing environmental conditions

Some people appear to be suffering, at least temporarily, from an inability to adapt to changing conditions, particularly increased pollution load. A healthy environment and lifestyle appears to be one in which an individual has sufficient control to limit the amount of adaptation required at any one time, and to shape the environment to accommodate his or her inherent nature, rather than the other way around.

g) environmental health issues are different for each of us

Environmental health issues vary widely according to different human characteristics and situations. People of different ages, gender, family or household types, races or cultures, health status or mobility, sexual orientation and lifestyle all encounter variations of general environmental health issues, which are unique to their situation. Each different physical setting and each different social and economic condition brings with it new viewpoints and priorities in environmental health. Understanding this diversity of issues is an important key to achieving health for all.

h) the paradox in environmental design

Many environments (e.g. public spaces, offices, schools) do not accommodate well the full range of human characteristics. People who are handicapped, less mobile, or chemically hypersensitive, for example, have been lumped in the category of 'special needs' and often excluded from consideration, even though making environments accessible to them might also benefit the rest of the population, both physically, by many of the health and safety features required, and socially, by their presence. Where special environments have been created, they accommodate well certain unique needs of such individuals, but often ignore the rest of their human characteristics and isolate them from others.

i) social conditions and being devalued trap people in unhealthy environments

Many people in Canada become locked into situations where they are exposed to unhealthy environments. Certain groups are subject to environmental hazards more than others. Devaluing or undervaluing people from certain groups (e.g. women, blue collar workers, handicapped people) can lead to widespread disparities in both social and physical environmental conditions.

j) prejudice is itself unhealthy

It is now clear that victims of prejudice and oppression suffer the direct physical and emotional health effects of such an unhealthy social atmosphere, in addition to the indirect environmental consequences arising from the discrimination they experience. The 'inferiorized' often internalize some of the attitudes toward them and can be subject to a spiral of decreasing self-esteem and the many other problems that develop from that. Many people are undervalued ostensibly because of one characteristic for which they are singled out, which is bad enough, but the nature of prejudice is such that the rest of their humanity is also rejected in the process.

k) social and personal support is important

The extent of an individual's personal and social support network is an important determinant of health. Isolation increases health risk and also guarantees that a person's needs, and value, remain invisible to others.

l) more personal control and participation can reduce hazards

Many people in Canada voice a hopelessness about reducing their health risks from environmental exposures, because they lack sufficient control over their personal and social surroundings to effect the changes they want. Participation of the people of Canada in the creation or modification of their physical and social surroundings is a feasible, and important, step in creating healthier environments. It is critical to introducing into the design process sufficiently detailed information about the full diversity of the people being served. A great deal of knowledge is already available about user participation and need only be implemented.

e) new ways of measuring effects of environment change our views

Advances in measuring pollutants and the ways we are affected by them, are revolutionizing the field of environmental health. Health' and performance effects are becoming apparent at levels of exposure previously considered safe, and questions are being posed about the unknown and possibly synergistic effects of mixtures of traces levels of different pollutants. Emerging new technologies provide the basis for scientific selection of healthier environments.

2. Gaps in Knowledge

It would be much easier to determine which environments are healthy, and which are not, if a number of gaps in our knowledge base were filled. These include:

a) detailed health effects on individuals

With few exceptions, we do not now know the actual effects of many environments on individual human beings. Much of the research designed to help decide what is healthy and what is not, is of an epidemiological or other statistical nature, or involves the effects of environment on animals rather than humans. While helpful in determining general environmental standards and identifying major hazards, this level of detail is not sufficient to make truly competent decisions about healthy environments for specific individual human beings, which after all is the basic question each individual in Canada faces, and that health care professionals must also deal with. Imagine a time when each person in Canada could have a profile of their own individual adaptability to different kinds of environments.

b) population profiles of environmental sensitivities

We do not know at the moment, with any degree of accuracy, how sensitivity to environmental insults, either physical or social, varies across the population. Without this, we cannot make competent decisions about design standards for physical, social, or economic environments in Canada. One profile urgently needed is that of people's degree of reactivity to common mixtures of indoor air pollution.

c) profiles of the extent of diversity in Canada

A true picture of the extent of diversity of human characteristics and situations among people in Canada has yet to be painted. Statistics are currently gathered under certain basic characteristics (e.g. gender, marital status, age, diseases, income, education, employment, etc) and usually analyzed separately. But each individual has many diverse characteristics, and a richer picture of these characteristics, and their various combinations, is more useful for physical, social, and economic design decisions. Categorizing people by single characteristics pulls us toward thinking about stereotypes rather than about accurate descriptions of people. How many young, black single women with an interest in learning more about computers are there in Canada, and how can we help them create a healthy environment for themselves? How would our approach differ if we knew more about them?

d) how physical, chemical and social stress affects our bodies and minds

We lack detailed and verified knowledge of the mechanism by which various stresses affect human health adversely. For example, it is known that low-level chemical exposures can trigger many measurable symptoms in sensitive individuals. There is no concensus on the mechanism by which such individuals are affected. Immunology research is teaching us that many body parameters are affected by stress of all kinds, but more work is needed to unravel the remaining details.

e) how to help people heal, who are victims of environmental stress

There is limited experience in helping individuals who have been adversely affected by their environment, to heal the effects. Clinical work is being done with people who become hypersensitive to minute chemical exposures, but there is no concensus yet on appropriate therapy, other than reducing the stress load on the individual. This is a serious gap in light of the fact that many physical and social factors in present-day Canadian environments pose considerable health risks.

f) knowledge of the effects of cleaner environments

We are no longer in the position, in Canada, of having comparison populations who can give us a clear picture of what health could be in a much less polluted and much less stressful environment. Most people in Canada are exposed to complex mixtures of indoor and outdoor contaminants, albeit at trace levels. While lifestyles vary considerably, most Canadians also experience a complex environment of social and economic stress. Competent decisions about the value of less polluted or less stressful environments will require good information about the effects of alternatives. To gather this knowledge, experimental situations will be required.

3. Methodological Considerations

Much of what is needed in the field of environmental health will involve the extension of technology and research methods well beyond the present state-of-the-art. It will involve tackling physical and social stressors without an overlay of hopelessness which presumes, without testing the limits of our ingenuity, that nothing can be done. Some examples of new methodologies needed are as follows:

a) protocols for measuring chemical hazards

It has become important to know, in far more detail than before, how products behave, physically and chemically. We require efficient and economical laboratory protocols for determining what substances are given off into our air and onto our skins, by the materials we handle and the environments we live in, from day to day.

b) protocols for measuring effects of environment

We need well-controlled, scientifically-verified procedures for obtaining accurate answers about the effects of specific environmental exposures on individuals. New and promising technology, such as computerized brainwave analysis and other developments described in this review, may provide the means of doing this.

c) protocols for responding to physical environmental complaints

We need better protocols for responding to situations in which individuals feel that their immediate environment is making them ill. While industrial situations involving high-level exposures have been well addressed, situations where exposure levels are below accepted standards often are not satistactorily resolved. These will require better detective work, a greater understanding of the possible effect of low level exposures on sensitive individuals, and more direct involvement of people who are affected.

d) protocols for measuring the effects of alternative environments

New procedures, facilities and technology are needed to open up a new field which might best be described by the term 'experimental environmental health'. Sometimes the best way of determining the effect of an environmental stressor is to remove it from the environment, and to measure how we feel without it. This would open the way to using individuals as their own scientific controls, and, in combination with protocols for measuring the direct effects of environmental stressors, determining the precise role of a particular stressor on an individual's health and wellbeing.

e) a means of interrupting prejudice and oppression

For years, we have relied on the idea that prejudice in Canada will naturally reduce with each new generation. Legislation has been used to guard against blatant violations of rights, and some focus has also been placed on acknowledging and welcoming multiculturalism in Canada. What has yet to be done well, is research to determine how we can deliberately reverse existing prejudices and eliminate oppressive institutional practices in a much shorter time frame. The key to doing so is making far more information available about the full humanity of devalued individuals.

f) methods for population-wide education about environmental health

Environment plays a far bigger role in health than has been previously accepted. Many people in Canada are both adversely affected by environment, and ignorant of the possibility that environmental factors may be contributing to their ill health. Those they consult about health often overlook environment as a factor. Since achieving healthy environments is a very individual affair, health for all cannot be achieved without widespread knowledge of the role of environment in health. Effective ways of spreading this knowledge must be chosen, tested, evaluated and implemented, if health for all is to be achieved.

g) methods for allowing greater individual environmental control

Both physically and socially, people have a better chance of maintaining their health and thriving in Canada, if they have control over their lives. Alternate living conditions, location, employment, education, and lifestyles are not available to those who are locked in, by lack of resources or by other oppressions that restrict their life choices. We need a more creative effort at every level (from building design to design of all our social and economic institutions) to allow individual diversity and control.

h) greater participation by individuals in physical and social design

A great deal of work has already been done on user participation in design. Methods appropriate to each new design situation need to be selected from the literature and put into practice.

4. Suggested Indicators

Canadian society is rich with indicators of environmental problems, in the form of specific physical health, mental health, and social problems that could be the result of unhealthy environments. At our present state of knowledge, however, it is difficult to link cause and effect. Enough practical experience has nonetheless been gained to guide the way in searching for environmental conditions which can and should be changed. Currently, we are often focusing solely on the indicator as a problem or disease in itself.

The first line of defence for understanding the connections between unhealthy environments and their effects, and therefore for finding reliable indicators, is direct contact with people who are experiencing ill health. In our zeal for obtaining objective and measurable indicators in the past, we have often ignored subjective information that provides clues which are both useful and necessary to carrying on the detective process. Once those clues have been processed and understood, there is an important role for scientifically determined indicators. The process requires both.

There are many problems in Canada that could have environmental factors as possible contributing causes. Rigorous investigation of these possible connections, including direct contact with individuals affected, will yield indicators which can be used with better confidence. Some possible health indicators are listed below along with the environmental connections suggested in the literature:

environmental condition	possible indicators
indoor air pollution	unexplained physical illness frequent medicinal drug use learning disabilities
outdoor air pollution	hospital admissions for respiratory illness mortality from respiratory and cardiovascular distress
contaminants in food & water	cancer incidence allergic reactions
sexism and oppression of women	female/male income disparity poverty among women sexual harrassment and assault battering of women
adultism	apathy among young people drug & alcohol abuse sexual and other child abuse youth suicide rate

unemployment	physical and mental illness poverty
prejudice	under-representation of groups in employment, educational and economic categories invisibility or closeting of certain characteristics
job stress	substance abuse mental health admissions unexplained physical illness
restricted information	unwanted pregnancy sexually transmitted diseases mortality from AIDS
undervaluing elderly or handicapped people	fear of aging loss of self-esteem inadequate health care poverty

For each type of environmental stressor, specific indicators are needed to signal potential problem levels, recognizing that this method will only alert us to the levels at which relatively large numbers of people may begin to be adversely affected, and will not be sufficient to warn of damage to those who are more sensitive than most to each factor.

For indoor air pollution, residential exposure guidelines have been developed and are being refined by a joint Federal/Provincial Advisory Committee on Environmental and Occupational Health, and contain some consideration of sensitive individuals. Environment Canada guidelines on outdoor pollutants provide some measure of problem levels, but do not yet address the problem of the more sensitive individuals.

Direct behaviour indicators for measuring our progress in reducing attitudes and actions which devalue other people, have yet to be systematically researched, refined and applied. We have not used a 'sexism scale', for example, to chart our progress in eliminating the oppression and undervaluing of women in Canada. Nor have we used a 'racism scale' or 'anti-gay scale' to measure the extent of prejudice that is still targeted against individual human beings who happen to have, among their diverse characteristics, specific origins, skin colour, sexual orientation, or family lifestyle that have been judged by others as undesirable, based on stereotypes.

We also need performance indicators, calibrated in clean, healthy environments, to be able to measure impairment of human beings due to environmental factors. The more ubiquitous the chemical contamination, the less we can call on present baselines as 'normal' performance.

5. Data Needs

It is sometimes appropriate to focus our full capabilities on a problem even if only a few people are affected (e.g. arranging a liver transplant for an ailing infant). However, the nature of the resources we allocate often depends on the magnitude of each problem we face.

We therefore need to know the number of people adversely affected by specific environments. For example, we need to know the number of children whose health and learning are actually now being impaired by indoor pollution in the schools. We need to know the number of industrial workers whose well-being has already been eroded by industrial chemical exposures. We need to know the number of women who are battered, the number of children who are abused, the number of people who are discriminated against, and so on.

Each area of study suggested in the previous sections will require its own type of data. Determining the list of 'numbers needed', however, is more appropriately left until basic, qualitative information about the problems we have discussed has been gathered and understood in the context of healthy environments. In this literature review, we do not pretend to have investigated environmental health problems in sufficient detail to more specific about data needs.

The next step after initial awareness of environmental health problems is more direct contact with individuals who have been affected. Even a count of the number of people who come forward with information, once invited, will be helpful in determining the minimum order of magnitude of each problem. The understanding gained from direct contact will help to determine exactly what, or who, should be counted.

6. Priority Questions for Research

General research needs have been described in the foregoing sections and in Part II: Analysis. The following list places a priority on certain subject areas over others:

a. **experimental environmental health and treatment of environmental illness**

Establishment of a field of research in which human beings are observed in alternative, cleaner, less stressful environments, and in which effective treatments are developed for people who are adversely affected by physical and social stressors;

b. **pollution, health and performance:**

Development of measurement devices and protocols for determining both obvious and subtle health and performance effects in individuals exposed to pollutants;

c. **elimination of prejudice:**

Development of practical ways of eliminating prejudice and discriminatory behaviour, individually and collectively;

d. **adaptable physical design**

Continued development of physical designs (e.g. buildings, public spaces), that accommodate a wider range of diversity;

e. **health monitoring devices:**

Development of devices that can be used by individuals at home, at school, or at work, for monitoring both environment and health conditions;

f. **specific hazard investigations:**

Further detailed investigation of newly recognized health hazards, e.g. airborne mycotoxins from household mould growth, and mixes of volatile organic chemicals in home and work environments;

g. **safe product research:**

Promotion of the design of safer, less-polluting products of all kinds; priority to building materials and interior finishings such as paints, and household combustion devices;

h. **social environment research:**

Investigation in more detail of the effects of various social environments on health;

i. **internalized oppression:**

Development of practical ways of addressing the effects of oppression in indivuals who have been undervalued, and encouraging their full powers and capabilities;

j. **alternative social structures:**

Investigation of alternative income systems, social structures, institutions and legislation which will promote a society where all people with minority characteristics are fully valued as human beings, and not merely tolerated;

k. **healthy lifestyles:**

Investigation of alternative lifestyles or lifestyle factors which will contribute to better physical and mental health.

7. Political and Social Considerations

Sufficient new knowledge has accumulated over the last few years, concerning the connection between environmental factors and ill health, to have caused increased pressure on politicians, governments, organizations, employers, physicians, and health care institutions to provide or promote healthier environments in Canada.

Some of the important new political and social considerations arising from the present review are as follows:

a. 'Health For All' requires elimination of prejudice

One inescapable conclusion of the literature is that environments of prejudice and oppression contribute to ill health in many ways, both destroying self-esteem and locking some individuals into situations where they have less control than others, over income, lifestyle and surroundings, and hence their own health. The government cannot pretend to work toward 'Health For All' without taking an active role in achieving the complete elimination of various kinds of prejudice and oppression presently operative in Canada, including:

- sexism (oppression of women by men)
- ageism (devaluing of elderly people by younger people)
- adultism (devaluing of younger people by adults)
- racism (devaluing of one race or ethnic origin by another)
- prejudice against one religion by another
- gay oppression (prejudice on the basis of sexual orientation)
- devaluing of people who are unemployed
- devaluing of people in less advantaged economic positions
- devaluing of people who are handicapped
- devaluing of people who are physically or mentally ill

b. Healthy environments require individual freedom and control

If Canada is to move towards healthier environments for all, we must move in the direction of greater control by each person over his or her own surroundings and lifestyle. This has implications for building design, housing, income distribution, employment policy, income alternatives, human rights, health systems, pollution standards, and many other areas. The vision is one of environmental choice, respecting the vast diversity of human characteristics and situations in Canada. It leads to more individual empowerment, more diversity, and, ultimately, healthier and more effective human resources in Canada.

c. Structural, legislative and attitudinal changes may be required

In many ways, Canadian society from top to bottom has been paralyzed with a kind of hopelessness that says certain things can never be changed. In pollution control, in environmental design, in health care, in social programs, the focus has been on meeting standards which accommodate the bulk of the population. The hidden assumption is that we cannot accommodate everyone. 'Health for All' contradicts this notion and suggests that we need flexible, clever designs in our physical environments and in our social structures, that will accommodate everyone well.

The literature did not reveal any real barriers to achieving this. It did suggest, however, that achieving healthy environments for everyone will require not only physical changes, but legislative, structural, and attitudinal changes throughout our society's major institutions as well.

d. Participation must be welcomed

Environments will be healthier, when those who are affected by them participate in their design and in their ongoing maintenance and development. This applies in legislative and social program design as well as in physical design. Many methods for user participation have already been developed and need only be selected and applied.

e. There is a worldwide market for expertise in healthy environments

Besides the obvious advantages for the health of people in Canada, a focus on making environments healthier will lead inevitably to economic spinoffs and exportable expertise of products and services. Becoming world leaders in the design and production of safe, non-polluting products and clean, healthy, supportive environments would be consistent with Canada's present world image as a clean, healthy, and peaceful country.

8. Implications for Action

There are four major areas of action that arise out of a commitment to seeing that healthy environments are available to everyone in Canada:

a) political vision and leadership

A new public stance at the highest level is needed to provide leadership in bringing about healthy environments, and to share the following visions:

i) Environment is important in the health of Canadians;
ii) Diversity is welcomed and valued in Canada;
iii) Individuals deserve to control their own environments;
iv) Prejudice and discriminatory behaviour in Canada must end;
v) Canada can become a world leader in environmental health.

b) scientific and social research, and industrial incentive

Technologies and methodologies which allow better understanding of the effects of both physical and social environments on health need to be developed and supported. Industries need to be aware that Canadians want and demand cleaner, less damaging, and less risky products and materials. They may require some research support to do this product development well. Assistance in promoting clean, safe Canadian products in world markets might also be offered.

c) public education

We need much more detailed and widespread education about the effects of environment on health, and on ways of creating healthy environments for everyone. We also need to create a better understanding of the fact that there is a wide range of vulnerability to environmental stressors among the population. It is important that this range not be used as a basis for prejudice by people in one part of the range, towards people in the other.

d) legislation

Existing legislative powers need review, to determine the extent to which every person in Canada has adequate control over his or her own personal environment. Health and safety legislation for neglected settings and groups, for example, for schools and for tenants, needs to be encouraged at the appropriate government level. Any aspect of existing legislation, regulations, or institutions that may inadvertently devalue or restrict the opportunities of any Canadians on the basis of their inherent characteristics or situations, requires critical review, with participation by the persons who are affected.

As an initial focus, a complete re-examination of the ways in which sexism is institutionalized should be undertaken, and proposals should be prepared for accelerating the timetable for achieving full equality for women in Canada.

PART II: ANALYSIS

1. Introduction

Section 2 following places a structure on the information we discovered in the literature. Here we offer the reader a synopsis and analysis of the written knowledge about healthy environments. We have pieced it together in a logical sequence, to make clear the underlying messages being put out, in common, by the many people who have contributed their work to the literature.

Health is more than an absence of disease. To conceive of complete health, imagine even getting close to doing every day what is possible on our best day. The concept of health does not in itself include the highest functions of human beings, as typified by the Ghandis or the Mother Teresas of the world; we may not be able to deliberately create an environment which grows that type of individual. We do know, however, that by making the environment negative, we may prevent that type of individual from emerging (Gerdes, K., 1987). The following analysis will look at both the positive aspects, the resources, that are needed to create health, and the conditions which may deny it, for people in Canada.

The subject matter is very broad. It spans physical and social aspects of everything we do in Canada. To organize it into manageable pieces, we have acknowledged three main viewpoints: settings, human characteristics, and environmental resources. In simpler terms, these groups represent: WHERE, WHO and WHAT. Like a three-dimensional matrix, or like the "blind men and the elephant", they each represent one way of looking at a larger problem, and any one issue will have components of all three (e.g. pollution of children in schools, lack of social support for elderly women in retirement homes).

The common message in Section 2.1, which deals with settings for healthy environment issues, is that there is virtually no setting or arena of life in Canada where health and safety do not arise as major environmental issues. The fact that we often think of occupational health and safety when we hear these words, merely means that we have not yet finished the task of formalizing the attention also needed in other settings - school health and safety, tenant health and safety, etc.

One common message in Section 2.2, which deals with human characteristics and situations, is that we are collectively a nation of diversity. We are not all the same. Individually we are also each a model of diversity. We cannot be referred to by one of our characteristics alone, and be adequately considered by others. For each characteristic and situation, there are certain environmental features that are appropriate to health. For each individual, very unique combinations, very self-tailored environments, may be required before we can say his or her environment is truly healthy. This multiple diversity demands a new cleverness in design, to achieve flexible, common environments that accommodate more people well, more of the time, and adaptable, special environments, that suit some of our more unique needs, at least part of the time.

The second common message in Section 2.2 is that many people in Canada have been devalued, for one reason or another. This has usually been done on the basis of one or more characteristics that are part, but by no means all, of their inherent nature or human situation at any given time: age, gender, family type, race or culture, illness or handicap, or orientation and lifestyle.

Being looked down upon is, in itself, an unhealthy environment for those being devalued, leading to loss of self-esteem. The devaluing of one group by another also prejudices the latter's access to environments that are healthy for them. The system really has no winners; most people are part of some devalued group at one point or another in their lives (for example, by growing old, becoming ill, or becoming handicapped).

Section 2.3 describes the environmental and social resources, and hazards, that constitute healthy or unhealthy environments for people. The common message is that everyone in Canada has many kinds of basic physical and social needs. If we are to create truly healthy environments, we cannot just do well in one area of need and ignore the others. Each area discussed is a necessary, but not by itself sufficient, condition for a healthy environment.

For example, all the personal and social support in the world may not prevent us from becoming ill when exposed to toxic contaminants in our environment. All the clean air in Canada will not guarantee health if we have not enough money to place nutritious food on the table. All the good food and housing in the world will not guarantee good health for our young people, if we treat them without respect and deny them sufficient autonomy to plan their own lives.

The keys to creating healthier environments (or the HOW that is missing above), are woven into each viewpoint in the matrix of Section 2, and addressed in summary form in Section 3. The bad news in section 3 is that many things that we have previously thought impossible, and diligently ignored because we couldn't conceive of how to bring them about, are necessary if the concept of 'health for all' is to be achieved. The good news in section 3 is that not only has our knowledge and technology advanced sufficiently to make what we need possible, but we could flourish as a country, not just physically and socially, but politically and economically, if we pursue such goals.

Achieving healthy environments for all is possible, but will require a concerted political, social and intellectual effort to bring it about, and may require extensive institutional, structural and attitudinal changes throughout Canada. Section 3 paints the vision that can and must be brought to life if we are serious.

The analysis in Sections 2 and 3 is limited, for the most part, to what we found in the literature. If the emphasis is on the negative, it is because that is the focus in the literature. Where there are gaps, we have identified them in Part I: Overview.

The structure in Section 2, the selection from the literature, and the visions in Section 3 are ours; we take full responsibility for their rationality and accuracy. Where our statements are specifically supported by the literature, references have been noted; the reader can follow up by referring to the Annotated Bibliography in Part III, which is ordered alphabetically by author's name.

For the reader who prefers to brouse rather than read sequentially, we have reproduced the index for Part II below. We would also encourage you to consult the extensive subject index, found in Part IV, which gives ready access to specific topics in all parts of the report.

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2. Healthy Environment Issues

2.1 By Setting

The environmental literature discusses health issues in a number of settings — at home, at school, in the workplace, in public places, including the natural environment. While some of the problems and opportunities are common to many different settings, there are many aspects which are unique to each. In particular, the amount of control any one individual has over environment varies greatly from setting to setting, with the home often representing the arena of greatest control.

2.1.1 At Home

Accidents in the Home

The risk of death due to accident in the home is about one third to one half of the risk of death in automobile traffic, for those under 65 years of age (Alphey, R.S., 1974). Accidents claim the lives of more children each year than the next six leading pediatric disorders combined, and produce injuries that require medical attention for one in three children. In the preschool age group, 91 percent of these accidents and over one-half the resultant fatalities occur in the home (Dershewitz, R.A., 1977).

Accident types with high injury rates are not necessarily the same as those leading to death. The severity of injuries differs among age groups even for the same accident type. In some cases, building characteristics, such as stair design, may contribute to the accident (Kose, S., 1986).

Many conditions in the home that do not present a high risk to able-bodied people, may present considerable risk to handicapped persons, who must diligently avoid situations which may worsen their disability (Durlak, E., 1987). Sometimes several factors together will make seemingly innocuous home environments more hazardous (e.g. physical reactions to indoor pollutants or medicinal drugs, affecting co-ordination and balance, combined with poor physical design or dangerous habits such as using stairways for storage. (Blumenthal, M.D., 1980), (Small, B.M., 1982).

Additional research on household accidents and injury can be found in (Cassidy, M.W.A., 1970), (Waller, J.A., 1978), (Webber, G.M.B., 1979), (Poyner, B., 1980), (Pauls, J., 1982), (Planek, B., 1982), (Szymusiak, S.M., 1982) and (Kose, S., 1987).

Indoor Air Quality in the Home

A great deal of the research literature reviewed is concerned with the presence of gaseous and particulate contaminants in the air of people's homes. Some pollutants are found in greater quantity indoors than outdoors, indicating that there are indoor pollution sources, and that the pollution levels are not solely due to infiltration of ambient outdoor pollutants into the home (Colome, S.D., 1982). Most often, the levels of exposure are sufficiently low that it appears that only more sensitive individuals respond adversely. No competent estimates have been made, however, of the numbers of people affected.

A Federal/Provincial Advisory Committee on Environmental and Occupational Health has outlined maximum acceptable residential concentrations, for short and long-term exposures, for nine substances or groups of substances (aldehydes, carbon dioxide, carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulphur dioxide, and water vapour) (Consumer Federation of America, 1987).

Some conditions, such as the use of unvented combustion appliances (gas stoves, kerosene heaters), contribute to pollution levels sufficiently high that they exceed industrial exposure standards, and may present a risk to everyone. The use of gas for cooking has been associated with a significantly increased frequency of chronic cough and a significantly greater percentage of people with impaired ventilatory function (Helsing, K.J., 1982). Other studies giving further information on both the emissions and the health effects of home gas cooking appliances include: (Ferris, B.G. Jr., 1979), (Kelley, M.D., 1979), (Melia, R.J.W., 1980), (Speizer, F.E., 1980), (Traynor, G.W., 1981 and 1982), (Girman, J.R., 1982), (Good, B.W., 1982), (Nitta, H., 1982), (Ozkaynak, H., 1982), (Hosein, H.R., 1986).

Tobacco smoking in the home is another source of indoor air pollution, and has been associated with symptoms of cough, wheeze, and sputum production, in the children of smokers (Dodge, R., 1982). The carboxyhemoglobin content of the blood (from absorption of carbon monoxide) can be as high as 7.6% in the fetuses of smoking mothers, compared to less than 1% in nonsmokers, and 5% to 10% in smokers (Jaeger, R.J., 1981).

The increased interest in energy conservation, through tightening homes to prevent air leakage, has in many cases had the effect of increasing indoor contaminant levels and health risks (Berk, J.V., 1980), (Breysse, P.A., 1981), (Young, G. Stewart, 1981), (Turiel, I., 1985), (Tobin, R.S., 1987). Newer design methods address the goal of combining energy conservation with low-pollution interiors (Small, B.M., 1983).

Products commonly used in the home have been cited as potential contributors to levels of indoor air pollution which could affect health (Turiel, I., 1985). Examples include: scented cleaning and laundry products, treated fabrics and paper products (Imbus, H.R., 1982), refrigerants, insecticides, sponge rubber, plastics, and numerous home finishing materials (Randolph, T.G., 1976). Aerosol hair spray can have significant health effects (Friedman, M., 1977). Art and craft materials used in the home can also be hazardous, particularly when used without extra ventilation. Ceramics, printmaking, painting and sculpting are particularly hazardous. The elderly, children, and people with health problems are especially vulnerable to the effects (Harrison, J., 1983).

Some modern building products, such as urea formaldehyde (UF) resin-bonded particle boards, emit formaldehyde and other gases. A yearly release of as little as one to two percent of the formaldehyde contained in the resin into the air of moderately tight homes can cause the ambient concentrations to exceed the recommended 0.1 ppm limit for formaldehyde. A surplus of formaldehyde from the manufacturing process, and a slowly decreasing generation of formaldehyde from hydrolysis, result in an exponential emission decay with a half-life of about three to five years (i.e. the emission will decrease by half in this time) (Gaudert, P.C., 1985).

Some individuals who are exposed to gases released from such building materials them become sensitized to them (Sprague, D.E., 1982). Urea formaldehyde foam insulation (UFFI), banned in Canada in 1980, caused health problems, as well as fungal growth and structural deterioration of homes (Chown, G.A., 1981), (Campbell, J.S., 1981). Some people who were exposed to UFFI gases, and who had no previous indication of chemical susceptibility, appeared to become generally chemically susceptible as a result of the exposure (Small, B.M., 1982). Sensitivity problems related to housing are commonly the result of continuous, cumulative exposure (Wales, R., 1984).

Some formaldehyde exposure is common in conventional homes, but it is often found in elevated levels in mobile homes (Breysse, P.A., 1979). Symptoms in a new Saskatoon mobile home occupied by an elderly couple included nausea, vomiting, dizziness, headaches, sleep disturbances, shortness of breath, burning eyes, running nose, and chronic fatigue. An initial indoor formaldehyde concentration of 0.7 ppm, was found, far exceeding the recommended limit for residential buildings of 0.1 ppm (Marchant, R., 1985). Senior citizens apartments built with particle-board underlay have also been found to have elevated formaldehyde levels (Kalnins, R., 1985).

Home heating systems have also been cited in cases of building-related illness (Randolph, T.G., 1976), (Silberstein, S., 1979). Ventilation conditions and weather conditions sometimes combine to cause backdrafting of oil or gas furnaces, with accompanying spillage of exhaust products into the home (Small, B.M., 1983). Home humidifiers are sometimes associated with growth of bacteria, which enter the air of the home (Van Assendelft, A., 1979), (Brundrett, G.W., 1979).

Many recent investigations have suggested that radon gas and its radioactive daughter products are present in many Canadian dwellings, and might be a contributing cause of lung cancer in Canada (McGregor, R.G., 1980). The two most important sources for radon in buildings are building materials and infiltration of gases from soil surrounding a home (Hildingson, O., 1982). Radon is also present in water supplies, and may enter the home air while water is running, e.g. during a shower (Hess. C.T., 1982). Decreased ventilation can lead to radiation exposures which exceed present guidelines (Axelson, O., 1979), (Budnitz, R.J., 1979), (Moschandreas, D.J., 1982). Radon concentrations in dwellings vary by more than two orders of magnitude, depending on building materials used, ventilation, infiltration, and regional geological factors, including water supply and substrate (Sachs, H.M., 1982).

Creating Healthy Home Environments

Residential indoor air quality can be improved by attention to principles of low-pollution building design, careful selection of materials, and creative ventilation (Small, B.M., 1983). Particulate matter reduction can be achieved with a medium efficiency extended surface fabric filter, and continuous low-speed fan (Raab, K.H., 1985). Simple cleaning technologies and non-odourous products can also avoid indoor pollution problems.

Choice is important in people's interaction with all environments, and it is central with home environments. Some constraints which may limit and distort any person's choice of home environment include: lack of resources and market availability, inability to cope with or plan for finding a better environment, degree of willingness or ability to move, knowledge of alternatives, and prejudice and discrimination (Rapoport, A., 1985).

Feeling secure at home is also important. Being burglarized is often experienced as being defiled, and can have psychological impacts on a person's relationships with others (Korosec-Serfaty, P., 1985). Home is often more than just our surroundings — a home gains meaning from the psychological and interpersonal events that occur in it (Werner, C.M., 1985), and is treated differently in different cultures (Altman, I., 1985).

Everyone has the right to shelter, but there are still people in our society who are homeless (Greer, N.R., 1986a). When designing shelters, programs, and permanent homes for the homeless, it is most important to take into account their psychological as well as physical needs, including the need for a sense of dignity (Greer, N.R., 1986b). One of the biggest obstacles facing developers of shelter or low-income housing is community resistance (the 'not in my backyard' phenomenon).

2.1.2 At School

School represents the mandatory environment for most of Canada's young people, from about age 5 through their mid-teen years and beyond. Both in the literature and on school board agendas, there is a new interest in the effects of school environments on health and learning. One area in which attention appears to be concentrated at the moment, is that of indoor air pollution in schools.

Unhealthy Aspects of the Physical Environment in Schools

Staff and students in schools are exposed to many pollutants which originate both within their school buildings, and in the neighbouring communities. Many of these pollutants affect brain function, learning ability, behaviour, health, and education. The sources of pollution range from industrial emissions and automobile exhaust outside, to painting, cleaning chemicals, reproduction processes, art and science materials, tobacco smoke, and even chalk dust, inside (Dadd, D.Lynn, 1982). In many schools, ventilation is insufficient to adequately exhaust the pollutants being generated inside. Some students and staff are experiencing acute adverse effects from such exposures, while others do not appear to be suffering, at least in the short term, from the same exposures (Small, B.M., 1985).

Air pollution in schools is rarely diagnosed correctly as a contributing cause of poor scholastic performance of susceptible children, and of the dopiness and confusion of susceptible teachers (Randolph, T.G., 1976), (Faust, H.S., 1981). When exposed to pollutants to which they are sensitive, school-age children can become irritable, excited, depressed, unreasonable or antisocial (Blume, K.A., 1976). In the majority of cases, the brain and central nervous system are the major areas of hypersensitive reaction which is reflected in the child's behaviour and ability to learn (Maclennan, J.G., 1985). Many children who demonstrate an inability to learn, who are slow learners, who have reduced reading comprehension and speed, reduced memory, or who show mental confusion, may improve when placed in a cleaner environment (Rapp, D.J., 1987). There is also evidence that air with a high ambient concentration of negative air ions may contribute to a moderate improvement in short-term visual and auditory memory, compared to regular classroom air (Kershner, J., 1985).

Formaldehyde, ammonia, hydrogen sulfide, sulfuric acid, carbon monoxide, sodium hydroxide and chlorine, among others, are used in the manufacture of various types of paper used in schools. The handling of most newspapers, magazines, hardcover and paperback books, art paper, paper tissues, plates and cups and glossy paper readily produces dermatitis in formaldehyde-sensitive individuals. Carbonless paper can produce mild dermatitis and severe upper respiratory symptoms as well as eye irritation. Chemical agents in various types of photocopier papers also causes dermatitis in some people (Fisher, A.A., 1983).

Some of the volatile inhalants emitted by products used in schools pose a health problem because of their neurobehavioural toxicity, and share certain properties with classic central nervous system depressants. For example, toluene and 1,1,1-trichlorethane have some pentobarbital-like effects (Rees, D.C., 1987).

Methyl alcohol evaporating from spirit duplicators, and from the copies themselves (which students like to sniff), represent a very specific hazard in schools, although many of these machines have been replaced in light of the evidence of this hazard. Adverse health effects reported include blurred vision, headaches, burning of the nose, sluggishness, dizziness, sore throat, dermatitis, chest tightness, and depression, all characteristic of toxic exposure to methyl alcohol (Pryor, P., 1981). In two cases persons exposed to methanol fumes initially developed clinical symptoms of multiple sclerosis, including visual disturbances, reduced abdominal reflexes, impaired coordination and difficulties with walking (Henzi, H., 1984).

Many schools were built with friable asbestos insulation material in the ceilings. Asbestos fiber concentrations in the air in several schools studied were in the range 5-40 ng/M 3 before removal of the insulation. The airborne asbestos concentrations approximately one week after removal showed reductions of 56 to 90 percent (Bozzelli, J.W., 1981).

Building-related illness ("the sick building syndrome") has been reported with increasing frequency in schools and kindergartens (Subcommittee on Formaldehyde and Air Contamination in Public Buildings, 1983), (Gravesen, S., 1986). The construction of the buildings, with flat roofs, often leads to water damage with subsequent microbial growth. Further, reduced cleaning budgets combined with wide use of needle-felt carpets, as well as improperly maintained ventilation systems, will lead to pollution by dust and microorganisms (Gravesen, S., 1986). Infection can also be spread among school-age children, by airborne viruses and bacteria circulated through the ventilating system, and from exposure in school buses (Riley, E.C., 1978) (Lidwell, O.M., 1979).

In Danish schools, significantly more numerous cases of allergy (asthma and hay-fever) were found in schools with textiles as floor coverings and significantly more numerous cases of skin conditions were found in those schools which were less than five years old or which had been renovated within the past five years. Some 31% of the pupils and 40% of the teaching staff stated that they took headache medicine at least once per month. Under one third of these pupils and over half of these teachers took headache medicine at least once weekly (Ibsen, K.K., 1981).

In 1973 a study was conducted by the Environmental Health and Light Research Institute in Sarasota Florida, showing dramatic reactions in hyperactive children. In two first-grade classrooms, the standard cool white fluorescent tubes and fixtures with solid plastic diffusers remained unchanged. The plastic diffusers stopped the transmission of any trace of long-wavelength ultraviolet. In two other classrooms, the tubes were replaced with full-spectrum fluorescent tubes that more closely duplicated natural daylight. By means of hidden time-lapse cameras, student behaviour was observed and recorded.

One study reviewed showed that under standard cool white fluorescent lighting, some children in first-grade classrooms demonstrated nervous fatigue, irritability, lapses of attention, and hyperactive behaviour. Within a week of the new full-spectrum lights being installed, a marked improvement in their behaviour appeared and overall classroom performance improved (Ott, J.N., 1973). Others feel that there is insufficient data to support a connection between standard fluorescent lighting and hyperactive behaviour (Wotton, E., 1981). However, it was also suggested that students working under fluorescent lighting with very good colour rendering become less visually fatigued than those working under some other forms of fluorescent lighting.

Other Potentially Unhealthy Aspects of School Environments

Increased psychological stress in the school setting, specifically examination stress, will alter immune functioning and heighten psychological responses (Didriksen, N., 1986).

Parental smoking, socio-economic status and scholastic performance are all related to smoking in high school students. Of the three factors, poor scholastic performance was clearly the strongest correlation, with parental smoking next in strength and low socio-economic status a weak third (Borland, B.L., 1975).

A severe isolation from real-life experiences in the education system has led to a separation from the fact that learning is an activity which is natural to human beings. Children have ceased to be authentic participants in the life of society and would learn better in an environment free from compulsory schooling and rigid age segregation (Priesnitz, W., 1987).

Making School Environments Physically Healthier

A Working Group of Ontario School Boards is presently reviewing procedures for "total building performance" evaluations, as a means of addressing indoor environmental concerns as they arise, and in the design of new buildings (Gosnell, D., 1987). The procedure, developed by the Toronto Board of Education's Energy Conservation and Environment Department, recognizes that a variety of elements contribute to occupants' satisfaction with a building environment, and also recognizes the special needs for those who experience greater sensitivity to the local environment. The procedure encourages all occupants to participate in the planning, design, problem-solving and operating practices of their building. Part of the rationale for the procedure is to give individuals or groups the tools to solve building environment problems.

The same group has begun to make it known to manufacturers and suppliers of materials used in schools, that they want to know, when tenders are submitted, what chemicals each object or material will emit into the air of the schools, or what contaminants will be absorbed by staff or students handling the materials (Gosnell, D., 1987). This is part of a long term program to reduce indoor pollution in the schools, by using only well-researched, "school-safe" materials that do not pollute indoor air (Small, B.M., 1985).

The Toronto Board of Education's Pollution and Education Committee has expressed a parallel intention, to investigate applications for rezoning of land within approximately 1000 feet of school sites, in order to monitor any possible outdoor pollution sources that might pollute school grounds or school air intakes (Gosnell, D., 1987). The Toronto Board is also encouraging all schools in its system to establish 'pollution relief centres', or rooms which are kept particularly clear of contaminants and dust, for use by sensitive students and staff.

The first special low-pollution, or "ecology" classroom was established in Kitchener, Ontario, to address the needs of students who had developed severe chemical sensitivities. Teacher Brad Tucker, one of the driving forces behind the project, is particularly knowledgeable about dealing with the special problems encountered by sensitive students. Some students, who could at first only tolerate the special classroom, are now able to spend more time in the rest of the school, using the ecology classroom as an oasis if reactions flare (Toronto Star, 1985).

The York Region Roman Catholic Separate School Board, operating north of Toronto, Ontario, is also planning to build two special ecological classrooms for children who suffer from severe allergies. The classrooms are part of a strategy to decrease the number of allergens in school buildings, generally, while at the same time addressing specific needs of highly allergic children. New schools in the system are being designed to take into account the average child's allergies (Kleiman, C., 1987).

There are many practical solutions that can be applied easily at the individual school and classroom level, to indoor air pollution problems in schools. These include careful control of all materials entering the classroom, strict school rules prohibiting smoking in the building, and education of staff and students about the effects of perfumed personal hygiene products on sensitive individuals (Schreiter, A., 1984). Classrooms and academic offices are more suitable for chemically susceptible individuals when fresh air is introduced directly into the room, rather than through a central recirculation system which mixes fresh air with large volumes of polluted air (Tall, F.D., 1987).

There are also many basic design criteria which can be applied in the planning of new school facilities and upgrading of old ones, to ensure a healthy working environment. Some areas for particular attention include reduction of noise, storage of volatile substances, and ventilation of odours in special purpose classrooms including woodworking shops, automotive shops, fine arts studios, music rooms, science laboratories, changing rooms, and various occupational training areas (Ball, R., undated).

Measurements of newly built preschools in Sweden show that organic compounds emanating from building materials decline in concentration mainly within the first six months of occupancy. During that time, symptoms such as dry throat, irritation of eyes and lips, hoarseness, hacking cough and itching are often reported. One way of assuring a healthier environment even in new schools is to allow the building materials to gas off during the first six months after construction, with no recirculation of return air allowed. During at least one to two additional years, the recirculation rate of return air can also be restricted, perhaps to 50% (Berglund, B., 1982).

There is a lack of safety standards for school science laboratories in Canada, and no systematic monitoring of safety conditions in some jurisdictions (Rieber, E.R., 1984). At the same time, the school is an ideal place to instill a lifelong awareness of potential hazards (Borrows, P., 1984). Development of consistent standards, procedures for monitoring, and programs for spreading information about school health and safety, would represent practical and useful steps toward healthier school environments.

2.1.3 In the Workplace

Physical and Chemical Hazards in Industrial Settings

In the past, many occupational diseases were named after the specific trades or occupations in which they were first observed. A few diseases still remain quite specific, but many biological, chemical and physical hazards are now so widespread that they may be encountered in jobs in a wide variety of industries (Proctor, N.H., 1978), (Medical Services Division staff, Workers' Compensation Board, 1984).

Chemicals of organic and inorganic nature, met as dusts, vapours, and fumes in the workplace, can cause respiratory allergic disorders. Widely different agents in different forms are implicated in asthmatic reactions (Pepys, J., 1982). It is also not unusual for industrial workers to experience deterioration in behavior or in mental function after exposure to common industrial chemicals. For example, a simple measurement of mercury exposure will give a reliable prediction of certain memory problems (Batts Young, B., 1981).

Neurotoxic volatile organic solvents used by house and car painters may lead to professional toxic encephalopathy after several years of exposure. The symptoms are memory impairment, fatigue, personality changes, headache and dizziness. Inner ear dysfunction is also common, and may be helpful in detecting early changes in exposed persons and in determining more accurate safety limits for harmful chemicals (Selikoff, I.J., 1975), (Arlien-Soborg, P., 1981). Peripheral neuropathy has been discovered among spray painters (Mallov, J.S., 1976). Central nervous system and psychological disturbances have been observed among workers exposed to styrene in glass fibre manufacturing operations (Lindstrom, K., 1976), (Axelson, O., 1978). Long-term exposure to solvents is also linked to chronic but nonspecific neuropsychiatric conditions (Axelson, O., 1976), (Hane, M., 1977).

Formaldehyde is often found in industrial environments, particularly where resin compounds which are employed as industrial laminates, binders and adhesives are produced or used. The potential for diseases of the skin has been well documented; it can induce dermatitis by irritation, delayed-type hyper-sensitivity and immediate urticarial reactions. Its capacity to irritate the eyes and upper respiratory tract is well established. Observations to date also incriminate formaldehyde in the induction of an inflammatory bronchitis as well as bronchial asthma (Bardana, E.J., Jr., 1980).

The welding process, common to many industries, produces potential respiratory hazards in the form of respirable metal oxide fumes and various gases, of which ozone and oxides of nitrogen are the most dangerous (Liss, G.M., 1987). The industrial setting can also include exposures to toxic heavy metals such as cadmium (e.g. in electro-plating plants). Cadmium can accumulate in tissues, and health effects of excess exposure can include lung damage and kidney damage or failure (Gibson, B., 1985).

Many industrial situations involve considerable exposure to diesel exhaust, which carries many health risks including possible carcinogenicity (Pepelko, W.E., 1980), (Unknown, 1982). Polycyclic aromatic hydrocarbon (PAH) compounds have been identified as the most potentially hazardous agents found in diesel engine exhaust. Although a properly maintained diesel engine would be likely to emit extremely small amounts of these agents, the possibility that they might be carcinogenic to humans singles them out for careful attention (Lassiter, D.V., 1978). Experiments with rats have suggested that diesel exhaust exposure during the development of an organism can lead to behavioural differences in adulthood (Laurie, R.D., 1980). Experiments with mice have shown an increased susceptibility to bacterial infection following diesel exhaust exposure, presumed related to the nitrogen dioxide and acrolein vapour components. (Campbell, K.I., 1980). Evaluation of the toxicity of the major components of diesel exhaust, with a view to developing add-on exhaust hardware, and to developing other techniques to reduce emissions from diesel engines, is of current interest (Dainty, E.D., 1986).

A variety of solvents and other potentially hazardous compounds are typically used in art workshops, including acetone, styrene, toluene, benzene, methyl cellulose acetate, xylene, and others (Wadden, R.A., 1985). Artists are among the highest sufferers of cancer, and other diseases, due to exposure to solvents, heavy metals, mineral dusts, gases, and other hazardous chemicals such as acids and alkalis. (Visual Arts Ontario, 1981).

Construction workers are exposed to a wide variety of toxic materials about which they know very little, and over which they have little control. The traditional solutions in fixed industry, using substitution, ventilation, process modification and administrative controls, are not always possible for construction sites (McVittie, D.J., 1986). Modification of building design to reduce indoor contamination for the sake of future building occupants could at the same time reduce some of the toxic exposures for construction workers.

Tobacco smoke, which contains over 50 known carcinogens and many other toxic agents, is a health hazard for smokers as well as nonsmokers who are regularly exposed to it. Serious acute health effects in nonsmokers, from short-term exposure, are probably limited to the one fifth of the population with pre-existing health conditions that are aggravated by exposure to tobacco smoke. Risks for everyone of long-term exposures include decreased lung function and lung cancer. The composition of tobacco smoke is such that there may not be a safe level for such exposure (Collishaw, N.E., 1984).

There are also hazards from the exposure to fungi in the workplace (Salvaggio, J.E., 1986). The diseases they cause may be so mild as to be asymptomatic, or may be extremely debilitating. Some buildings have humidifier and/or ventilation systems which are contaminated with fungi, and which may cause symptoms among the occupants. (Giddings, M.J., 1986).

The reader is referred to further descriptions of industrial environmental hazards in the literature, which are illustrative of the general points made above, for example: asthma produced by exposure to toluene di-isocyanate (Chester, E.H., 1979), (O'Brien, I.M., 1979); effects of chronic occupational exposure to benzene (Fishbeck, W.A., 1978); reproductive hazards at work (Chenier, N.M., 1982); occupational hand eczema (Pedersen, N.B., 1980); and neurobehavioural toxicity (Wood, R.W., 1981).

The interaction of workplace conditions and other factors can increase the risk of injury on the job. For example, delayed effects of social alcohol intake have been observed up to 18 hours after ingestion. These included lengthened reaction time, poor motor performance, and decreased motor sensory skill, as well as inability to manipulate and position without tactile and/or visual facilitation (Wolkenberg, R.C., 1975). Abuse of other substances, including illicit as well as prescription drugs, can also increase risks. Close co-ordination will be required between management of alcohol and drug-related problems and the management of safety in the workplace (Shain, M., 1982).

Recognizing the possible hazards associated with one's chosen occupation, whether it be exposure to organic dusts, chemicals or dangerous machinery is of greatest importance for prevention of injury or infection (Ontario Federation of Labour, 1982), (Canadian Centre for Occupational Health and Safety, 1985). Persistent symptoms, no matter how small, should be regarded as important, and measures taken to locate their source. Care must be taken when identifying the cause of a worker's complaint, as these diseases may be misdiagnosed, which in turn may lead to irreversible physical damage (Giddings, M.J., 1986).

The true dimensions of industrial disease are not totally revealed by Workers Compensation Board statistics. Often the real causes of disease and injury on the job are ignored, and economic considerations prevail at the expense of the health and safety of the worker. There is widespread resistance of both senior and middle managers, to increased worker participation in both work organization and job design questions. Greater workplace democratization may be a necessary condition for bringing about adequate reform of workplace health and safety (Sass, R., 1986).

Physical and Chemical Hazards in Offices

Substances such as ammonia, asbestos, benzene, cadmium, carbon monoxide, ethanol, fiberglass, formaldehyde, methanol, nitropyrenes, ozone, PCBs, particulates, radon, tobacco smoke, toluene, trichlorethane, trichloroethylene, trinitrofluorenone and vinyl chloride are all present in the typical office environment, albeit in small quantities. Some are suspected or proven carcinogens, while a number, such as trichloroethylene, carbon monoxide and benzene have been implicated in central nervous system damage (Makower, J., 1981), (Nussbaum, K., 1981), (Konopinski, V.J., 1983). Office contaminants are usually present in very low concentrations relative to promulgated or recommended industrial hygiene exposure levels, but in high concentrations relative to outdoor air. Sources include new and aged building materials, wet-process photocopiers, tobacco smoke, and building maintenance products (Miksch, R.R., 1982).

Recent investigations suggest that employees who work in sealed office buildings make more mistakes, have more office accidents, take longer to do tasks and are sick more often (Cannon, M., 1987). Inadequate ventilation in such buildings can also bring on symptoms of headaches, drowsiness, tired eyes and upper respiratory irritation (Rand, G., 1979), (Hollands, J., 1984). Severe outbreaks of illness have also been traced to ventilation problems in sealed hospital buildings (Sterling, T.D., 1983).

In one investigation of health and environmental complaints in a large, modern, hermetically-sealed office complex, there was little indication that the type of symptom and type of environmental complaint were correlated in any meaningful way (Benard, J.M., 1985). Other investigations have shown under more controlled conditions that specific sources can produce certain symptoms. For example, exposure to airborne emissions of carbonless copy forms can cause acute nasal congestion (Camp, J.E., 1985). Handling such forms can produce urticaria on the hands, and changes in lung function characteristic of upper airway obstruction have also been observed (Marks, J.G., Jr., 1984). The offending agent in the paper which caused the allergic contact dermatitis proved to be a colour-forming coating composed of paratoluene sulfinate of Michler's hydrol (PTSMH), which has a low sensitizing capacity (Marks, J.G., 1981).

The current technologies used in photocopying machines involve a number of health concerns, including the refilling and disposal techniques for toner in dry machines, levels of isodecane produced by wet-process machines, the levels of ozone produced, heat and noise levels, and escape of ultraviolet light (Halton, D.M., 1983).

Most commercial settings experience carbon monoxide concentrations above zero indoors, because it tends to seep into buildings from vehicular emissions outside. The levels commonly found are usually below 5 ppm and seldom higher than ambient air quality standards. However, indoor garages and buildings with attached indoor parking areas are exceptions and can experience relatively high carbon monoxide concentrations (Ott. W., 1982).

Tobacco smoke exposure is greater, on average, in the workplace than it is in the home (Repace, J.L., 1983), and has often been assumed to be a major cause of building illness. While there is no doubt about the carcinogenicity and the allergenicity of tobacco smoke, (Repace, J.L., 1983), (Repace, J.L., 1984), there is still some question as to its relative importance, compared to other sources, as a cause of building illness (Sterling, T.D., 1987).

Other factors besides chemical sources and inadequate ventilation may also come into play in modern office environments. Artificial lighting, high noise levels, fluctuation in temperature and humidity, and low-level radiation and electromagnetic fields (e.g. from video display terminals) are also being investigated as potential health hazards capable of causing stress and illness (Makower, J., 1981), (Sterling, E.M., 1983), (Fleishman, J., 1984).

Creative office design and effective ventilation, along with strict attention to chemical sources and other physical factors that are capable of adversely affecting health, may be required before the now-common 'sick building syndrome' is under control. It is also becoming clear that more medical knowledge is required concerning the health of individuals affected, because of the potential for increased sensitization that may last well beyond remedial changes in the office environment (Small, B.M., 1984), (Small, B.M., 1985). Effective control strategies can be implemented that do not compromise energy efficiency (Miksch, R.R., 1982).

The Range of Vulnerability Within the Working Population

Some workers react adversely to certain substances at low levels, below the threshold concentration associated with injury or definite discomfort in the majority of workers. These particular workers are distinctly more susceptible than the majority, and may be inadequately protected by control procedures that appear to suffice quite well for most employees (Reinhardt, C.F., 1978). At the same time, some situations that demonstrably affect only susceptible workers, may still present longer-term dangers to the health of so-called nonsusceptible workers. Reducing total environmental chemical exposures may be the most appropriate solution to the risk problem for everyone (Wright, M., 1979).

In the past, episodes of building illness involving groups of people were often labelled as mass hysteria. The subjective symptoms documented are similar to symptoms experienced by persons being tested for susceptibility to various petrochemicals. Specific testing for chemical hypersusceptibility may remove the uncertainty in such cases (Miller, C.S., 1979).

Psychological Factors in the Workplace

Most people generally like their jobs, are interested in their work, and are comfortable with their supervisors and their fellow workers (Skrzycki, C., 1987). However, many conditions and attitudes within the workplace can be stressful, and need to be carefully examined if truly healthy environments are going to become available in workplaces throughout Canada.

Poor mental health is directly related to unpleasant work conditions, the necessity to work fast and to expend a lot of physical effort, and to excessive and inconvenient hours (Cooper, C.L., 1976), (Resin, T.S., 1978). Inability to adjust and control ventilation, lighting, temperature, and humidity to individual comfort needs represents a stress that has a significant influence on health and comfort of office workers. Health-related symptoms can also be aggravated when employees are unable to participate in the way time at work is allocated, when jobs are not secure, and when there are poor relations with supervisors (Sterling, E.M., 1983).

In the workplace, creating an environment of sensitivity, consideration and tolerance of differences is considered a positive mental health practice (Mental Health and the Workplace Committee, 1984). Helping people find work situations that allow them to reach personal goals they define for themselves, can make an organization a dynamic, fulfilling place to work, and creates the type of climate conducive to effective performance. Worklife choices may include leaves of absence, job sharing, flexible part-time work, transfers, and other choices (Hopkirk, G., 1986). The organization of worktime must also respond to the specific needs of women, who now make up a significant part of the labour force (Simard, M., 1986).

With new technology now available, even more flexible work-options may become commonplace. For example, running a computer-based business from a home office is a work alternative that allows flexibility and control over the working environment. Many people are able to integrate family and work lives when they work at home. Higher efficiency, economy, reduction of stress, and the elimination of commuting time are other benefits. Telecommuting has possibilities for creating employment for the disabled (Chalupiak, S., 1987). Care will be required during the expansion of such alternative work-options; employment of home-based workers as independent contractors, for example, can present the risk of creating second-class corporate citizens without full employee rights and benefits (Christensen, K.E., 1986).

2.1.4 In Public Places

There are many healthy environment issues regarding public places in Canada. The literature concentrates more on urban-related health issues, and our discussion below reflects this, taking the opportunity to designate cities as a kind of public place. It is important, however, to remember that all Canadian settlements, of any size, need the public places within them, as well as their general environments, to be healthy for everyone. Designing for the diversity of people, and the diversity of uses, of public spaces, represents a considerable challenge.

At the same time as Canadians may be very diverse in some of their characteristics, we must remember that urban dwellers, suburbanites, people in small towns and settlements, and in rural or wilderness areas still have very many human characteristics, goals, and needs in common (Baldassare, M., 1975). Many of the details of the following discussion will therefore have some applications in all these settings.

Indoor Air Pollution and other Hazards in Public Buildings

In general, the move to increase energy conservation in public buildings has led to increased concern about health effects from indoor air that is being contaminated while being recirculated (Dimmick, R.L., 1980). Special purpose public buildings such as transportation terminals (e.g. train stations and bus depots), and medical facilities, also present special indoor air quality problems because of strong indoor pollution sources (Suess, M.J., 1984).

Specific indoor pollution problems are increasingly showing up in the literature. For example, high formaldehyde levels have been found in day care centres where extensive use has been made of particle-board (Olsen, J.H., 1982). Lack of ventilation can also lead to unacceptably high concentrations of carbon dioxide (Lundqvist, G.R., 1982). Dried detergent residue left in carpets after they were shampooed has caused respiratory and eye irritation among both day care staff and children (Kreiss, K., 1982).

In other situations we have taken for granted that traditional technology is benign, only to discover, upon measurement, that major health hazards may have existed for years. For example, episodes of illness have been reported in ice arenas, which have been traced to high levels of carbon monoxide and nitrogen dioxide from ice-resurfacing machines. Typical symptoms have been headache and nausea among children and headache among adults, as well as sore throat and tightness in the chest. Carbon monoxide concentrations up to 250 ppm have been found, which far exceed acceptable outdoor ambient air quality standards (Anderson, D.E., 1971).

Fortunately, more jurisdictions are moving towards severe restrictions and even total prohibitions on tobacco smoking in indoor public environments, including business offices. About one-third of Canadian adults smoke regularly. The primary obstacle to overcome is that smoking is a powerful addiction with failure rates after cessation as high or higher than those for heroin addicts or alcoholics (Wigle, D.T., 1982).

The physical design of public buildings and outdoor spaces is also important for ensuring safety for Canadians. Stairway accidents, for example, are largely caused by design shortcomings and can be largely prevented by thoughtful design features (Asher, J.K., 1977).

Air Pollution in Canadian Communities

Air in communities throughout Canada, from remote settlements to dense urban areas, is contaminated with low levels of pollutants emitted by industrial sources, municipal incinerators and utilities, motor vehicles, household heating systems, fireplaces and woodstoves, and local use of pesticides and herbicides. The literature is clear that air pollution is a health hazard, both to the general population and to many individuals who, for one reason or another, find themselves considerably more vulnerable than others to its effects. There is no doubt that aiming for the lowest air pollution levels that can be achieved, within our resources and our technology, is working in the direction of healthier environments for all Canadians.

In high sulphur dioxide and smoke pollution areas, adverse effects on ventilatory functions and an increased occurrence of acute respiratory diseases can be expected (Saric, M., 1981). Prevalence of respiratory disorders and allergies can also be a function of proximity to major roadways, because of exposure to automobile exhaust (Nagira, T., 1981).

The effects of carbon monoxide from automobile exhaust are particularly marked for those involved in vigorous exercise. The endurance performance of distance runners in urban environments, for example, is subject to interference from commonly encountered carbon monoxide concentrations for many hours after exposure to the gas has ended. While at rest, breathing air containing 50 ppm of carbon monoxide causes the concentration in the bloodstream (carboxyhemoglobin, or COHb) to rise to 5% in five hours. During vigorous exercise, this level of air pollution can produce a concentration of 5% in less than one hour. It is not metabolized but must be dissipated by being exhaled (Daniell, H., 1976). Additional Effects of low levels of carbon monoxide encountered on urban streets and in traffic tunnels have been documented in the literature (US National Research Council, 1969).

Absorption of auto exhaust fumes also leads to elevated whole blood lead levels in distance runners. While the elevations do not appear to constitute a short-term health hazard for adult runners, the longterm or chronic effects of these "above average" levels are not known (Van Rensburg, J.P., 1982). Lead from vehicles may not be the most significant contributor to blood lead levels of children living or being educated in high-traffic urban areas (Millar, I.B., 1982). Urban soils and settled dusts, both indoors and outdoors, could have a significant impact on human health, because they also carry heavy metal pollutants, including lead and cadmium, from industrial sources (Solomon, R.L., 1977). Urban atmospheres also receive gas and particulate emissions from automobile brakes and clutches, including asbestos particles (Jacko, M.G., 1973).

Waste incineration emissions are also receiving attention as potential health risks, since data on health effects of many chemicals are incomplete, particularly for long-term, low-level exposures. Technical and operational measures need to be implemented to reduce emissions of chemicals, and questions need to be asked about siting of new incinerators and about acceptable levels of health and environmental risk (Macpherson, A.S., 1987).

Are Cities Healthy?

Some may argue that because of the tendency for urban areas to have higher pollution concentrations than non-urban areas, cities themselves are, by nature, unhealthy. It is important, however, to consider both the specific design of a city, and the specific technologies being used within it, before being tempted to declare cities, in general, as unhealthy. The choice of the gasoline engine, for example, for personal transportation, has had an enormous adverse impact on pollution and health. It is more useful, in terms of actions we can undertake to improve environments, to conclude very specifically that gasoline engine technology creates unhealthy environments, than it is to conclude that cities are unhealthy. Cities with alternative, cleaner technologies can certainly be imagined and ultimately created.

There are, of course, many aspects of cities the way they exist now that are unhealthy: noise, air pollution, traffic congestion, crowding and lack of open areas of trees, lakes, grass, and rivers. Many people within our cities are subject to additional stresses, such as living in higher crime areas, working in jobs exposing them to toxic chemicals, or being denied an adequate education due to discrimination (Kennedy, D.A., 1977). The chronic, cumulative health effects of such stresses may be of considerable importance (Bakacs, T., 1972). At the same time, cities are high-energy places with many activities, which in itself can be very health-supportive to urban dwellers (Humiston, K., 1987).

In urban areas, health risks from physical problems were given a great deal of early attention (e.g. sanitation), while those from social conditions (e.g. overcrowding) were often ignored (Weinstein, M.S., 198?). Now, researchers are putting more attention on social structure and participation of the city dweller in ongoing environmental design. "Solutions must come from the grass roots level, and must deal with the underlying issues, not the symptoms" (Duhl, L.J., 1984). Isolated specialization in urban planning, without public input, can be destructive to the quality of urban life (Appleyard, D., 1976).

Further improvement of urban environments is required: to remove causes of danger; to maximize opportunities for contact between individuals at block, neighbourhood and town levels; and to enhance the visual and aesthetic qualities of the urban environment, as one means of promoting a favourable change in individual psychological behaviour (Pressman, N.E.P., 1982).

Natural Environments

The outdoor environment is an important factor in children's social and psychological development. High-rise buildings, traffic, long distances to attractive play spaces, and bad weather, may restrict children from staying outdoors, as will a lack of suitable activities for adults who accompany their children to the playgrounds. Allowing children opportunities for concrete action upon the environment (e.g. digging, building things) helps them to develop a sense of competence, and encourages them actively to bring about changes in the environment (Bjorklid, P., 1985). Creating more habitable environments requires understanding of natural settings — air, water, geology, plant and animal life (Whiston Spirn, A., 1984).

The United Nations Conference on the Human Environment (United Nations. 1973) declared that both the natural and "man-made" environments are essential to people's well-being and to the enjoyment of basic human rights, and that we must shape our actions with a more prudent care for their environmental consequences. The conference called for: protection of non-renewable resources; the halting of the discharge of toxic substances and the release of heat in such quantities as to exceed the capacity of the environment to render them harmless; economic and social development for ensuring favourable living and working environments; integrated and coordinated approaches to development planning so as to ensure that development is compatible with the need to protect and improve environments; education in environmental matters for both young and old; scientific research and development to solve environmental problems; and international cooperation to spare the earth the effects of nuclear weapons and all other means of mass destruction.

Many natural and synthetic compounds have entered the ecosystem in the past 40 years. The adverse effects of many of these were unanticipated, in that these compounds are highly resistant to degradation by natural processes and there is often a pervasive buildup on a worldwide basis. In the case of carcinogens, mutagens and teratogens, safe levels cannot be established because even extremely small doses must be assumed to result in an increase in the number of people who are adversely affected (Ray, S.M., 1980).

Acidic precipitation, due to the growing introduction of sulphur dioxide into the atmosphere, has been linked with detrimental effects on fish, vegetation, buildings and people (Kruus, P., 1979) (Kato, T., 1981). According to a new United Nations report, acid rain is now a health threat to more than half a billion city dwellers worldwide, and another billion people are exposed to high pollution levels that result from coal, wood, oil combustion and automobile traffic dust (Toronto Star, 1987). Studies on the indirect effects of acid depositions on water quality have shown that when acidified lake water is left standing in the plumbing system the quality of the water can deteriorate; levels of copper and lead found in it can exceed federal guidelines (Franklin, C.A, 1985). Environmentally-sensitive people may be the first to feel the effects of low-level environmental contaminants (Bradley, J., 1987).

Healthy Environment Issues (continued)

2.2 By Human Characteristic and Situation

For each human characteristic, and for each unique combination of human characteristics and situations, "healthy" environment will take on a different meaning. What is healthy, or at least benign, for one person, may be unhealthy for someone with different characteristics. The key to understanding healthy environments is to understand people in considerable detail, and in particular, to understand that human beings are, by nature, a very diverse lot.

Many people are subjected to environments which are unhealthy. In many, if not all, such situations, the same people also happen to be subject to prejudice because of some specific characteristic (e.g. being old, being handicapped, being female). While there are specific physical or social conditions in these environments (e.g. pollution or crowding) that are the direct causes of ill health, the devaluation by others is the mechanism by which these people get stuck in, or stay trapped in, unhealthy conditions. The message conveyed is a simple one: "we don't care if your environment is unhealthy, because people like you aren't as valuable as people like us".

In each of the subsections following, we address a particular array of human characteristics, with which we often distinguish one person from another. Where we have found sufficient information in the literature for each characteristic, we have addressed these issues:

1) How people who happen to have this particular characteristic are sometimes devalued by people with different characteristics;
2) How people with this characteristic are mistreated; how they get stuck in unhealthy environments more than people with different characteristics;
3) What the real differences are that go along with having this particular characteristic; how these differences compare to common stereotype images;
4) How people with this characteristic differ in vulnerability to environmental factors;
5) What environments would be healthier for people who happen to have this particular characteristic.

The array of human characteristics discussed is not exhaustive. These particular ones were chosen because they illustrate well the manner in which the devaluing of one group of people by another may contribute to unhealthy environments.

2.2.1 Age

In Canada, we sometimes vary our treatment of people, on the basis of the age that they happen to be at the time, relative to our own age. People who are very young, and people who are very old, are often treated very differently from the rest of the population, who are temporarily inbetween these two extremes in age.

The rational basis of this variation in treatment has to do with distinct physical and other differences in human beings of different ages. Many features of the environment that a person who is under 10 years of age will need, to be healthy and to grow, will differ from those of the environment needed for someone who is, for example, between 40 years and 50 years of age.

The irrational part of treating people of various ages as differently as we sometimes do, stems from our use of stereotyped images of people who are a certain age, without reference to the considerable variability among people who happen to be in the same age group, and without reference to the many human characteristics we still all share, despite the difference in our ages.

The Devaluation of Young People

Young people have suffered innumerable injustices as a result of ingrained attitudes on the part of people older than themselves. Like racial and cultural minorities, like women, like those missing one or several of the "normal" human traits, children have been stereotyped as somehow inferior (Davies, F.L., 1988). Despite surveys showing that Canadians place the issue of child health high on the national agenda, people at the Canadian Institute of Child Health often feel that children are Canada's forgotten people (McCauley, G., 1987).

How Young People Differ in Vulnerability to Hazards

Many of the physical differences between younger people and older people are obvious, for example, size and strength. Internal physical differences are less visible, but just as important. For example, pre-school children have a relatively higher metabolic rate and ventilation at rest than older people, leaving them more vulnerable to inhaled pollutants (Stephens, R., 1981).

The embryo and foetus are highly vulnerable to environmental assault, and as a result, the prenatal period is considered a critical stage in human development. Avoidance of social, prescription and illicit drug use, as well as other harmful chemical exposures, may prevent many adverse outcomes for the baby (McCluskey-Fawcett, K.A, 1986). For some prenatal chemical exposures, such as carbon monoxide, some researchers conclude that no threshold can be established below which there is a margin of safety for the foetus (Waterman, F.K., 1984).

Environmental factors to which a young person is exposed in the womb can sometimes be contributing causes of birth defects or cancer. Some that have been implicated include radiation, chemical agents such as nitrosamines and organic solvents, and infectious agents such as the Epstein-Barr virus. Certain compounds may lead to birth defects when a prenatal exposure occurs early in pregnancy, and may act as carcinogens when the exposure occurs late in pregnancy (Gordis, L., 1986).

Young children appear more susceptible to exposure to heavy metal contaminants, particularly in combination, than are older people (Chisolm, J.J., 1974). Children absorb and retain a greater percentage of ingested lead than adults (Schauss, A., 1980). Pre-school children also have more contact with contaminated soil outdoors than older children or adults (Stephens, R., 1981).

Early exposure to lead can lead to subtle neurological deficits and behavioural impairments. These effects may be immediate or delayed (Finberg, L., 1974) and are often not recognized until the child enters school, when he or she exhibits a short attention span, hyperirritability and aggressiveness, sensory and motor impairments (Weiss, B., 1974). Marked reductions are also seen in general development of the hippocampus portion of the brain, following postnatal lead exposure (Petit, T.L., 1983).

Research on the effects of such contaminants on children has become highly specific. For example, cadmium has a significantly stronger effect on verbal IQ than does lead, and lead has a stronger effect on performance IQ than does cadmium. Hair cadmium and lead levels have been significantly correlated with both intelligence scores and school achievement scores, but not motor impairment scores (Thatcher, R.W., 1982). A strong case has been presented in the literature that lead at low doses is an important and widely distributed neurotoxin, and that particularly for children, its removal from the human environment is warranted (Needleman, H.L., 1983).

Long-term exposure of children to contaminants such as formaldehyde, from certain building materials, leads to a higher occurrence of abnormal findings in immunity indicators. Elimination of the exposure leads to a prompt normalization of the findings (Pfeifer, J., 1983).

Deaths and injuries due to road-crash involvement are a major health and safety problem among youth. Alcohol is one of a number of factors involved in the overrepresentation of young drivers in road crashes. Frequent and heavy alcohol consumption among teenagers and young adults is not unusual, although they are less likely than older age groups to drive after drinking. Nonetheless, those young people who drive after drinking have a greater risk of crash involvement than older drinking drivers at all blood alcohol concentrations (Mayhew, D.R., 1986).

How Young People Are Mistreated and Held in Unhealthy Environments

Most young people who find themselves in unhealthy environments have little, if any, power of their own to change the situation. Before birth, in early childhood, within the home, and at school, the kind of adult support available and the nature of the physical environment, are in most, if not all cases, non-negotiable.

Young people are sometimes victims of acts of physical, sexual or emotional abuse by adults, often by people they know and live closely with. Child abuse is any act by an adult, or the omission of any act, which results in harm to a child. Physical abuse involves any kind of injury or extreme punishment of a child and also includes the failure to provide a child with the food, clothing, shelter, and health care needed for the child's optimum development. Sexual abuse is the exploitation of a child by an adult for sexual gratification and includes incest, sexual molestation, sexual assault, and the exploitation of the child for the purposes of pornography or prostitution. Emotional abuse or neglect is the constant ill-treatment of a child through the withholding of affection or through repeated humiliations. (Canadian Home and School & Parent-Teacher Federation, 1986).

Some physical mistreatments are only now beginning to be recognized. For example, children may be adversely affected by trace levels of contamination brought home from their parents' workplaces. A parent's workplace exposure to chlorinated solvents increases the child's risk of developing leukemia. Parental exposures to spray paint, cutting oil, methyl ethyl ketone, and dyes or pigments may increase this risk (Raloff, J., 1987). The use of incense and garden pesticides has also been associated with notably increased risks of leukemia during nursing and pregnancy.

Young people who live with people who smoke often have higher rates of respiratory illness than those in non-smoking households (Bonham, G.S., 1981). This shows up most clearly when the additional chemical burden of living close to a main highway is present (Kasuga, H., 1979). The effect of parental smoking on the pulmonary function of their children is independent of any direct use of cigarettes by the children (Tager, I.B., 1979).

Many young people are adversely affected by their immediate physical environment or by their diet. Environmental health information and accurate information about the possible effects of airborne allergens and diet are only now becoming widely available to adults in Canada, and have still not penetrated school curricula and nutritional training to any great extent (Daglish, S., 1987). Young people often lack awareness even of the possibility they may be impaired by what they breathe or what they eat, and if they become aware, are sometimes given little or no credence or support by family members or health professionals. Their power to make needed lifestyle, environmental or dietary adjustments is more limited than that of adults. Environmentally-related learning or behavioural problems often continue without appropriate diagnosis or treatment, with long-term adverse consequences for the young person in terms of personal relationships, skills development and self-esteem (Rapp, D.J., 1986).

Television has a major impact on children in at least four areas: aggressive behaviour; racial and sexrole stereotypes; decreased interest in reading and school activities; and poorer health habits and attitudes. The modest statistical associations between television viewing and children's cognitive or behavioural problems may be masking the more extreme responses of small groups of especially vulnerable children. The identification of a high-risk subsample of children has been virtually ignored in the research that has been conducted thus far (Zuckerman, D.M., 1985).

Adults in Canada often do not take young people seriously, commonly referring to them as "kids" and not treating them like people in their own right (Ball, L., 1987). As a result, many young people feel superfluous or unimportant, feel that they don't fit in, and that it doesn't matter what they do. Adults often expect less than full humanness from young people, and do not treat them with respect (Turner, G., 1981).

Adults do have power over young people and can force them to do things (Ball, I., 1987). Many older people still feel that it is acceptable, perhaps even necessary, to treat children in ways that are usually not considered acceptable to treat adults, for example: to be humiliated, insulted, judged constantly, interrogated and compelled to obey (Davies, F.L., 1988). Such attitudes erode a young person's sense of importance, of confidence, and of power. Then when young people become older, they are more inclined to go along with oppressing others, and to give up following their own ideas. It is important that young people maintain pride in themselves and not collude with many false ideas about youth that are pushed at them by older people (Turner, G., 1981).

Adults may underestimate younger people's general environmental competence and ability to choose healthy environments, while at the same time overestimating specific areas of children's performance, for example, in traffic safety (Spencer, C., 1985). In many institutional settings for young people such as schools, control, authority and accompanying surveillance are based on the underlying assumption that in their absence, children will be out of control. The resulting environment (which does not always reflect the goals that teachers, administrators or designers said they were trying to achieve) often creates conformity and teaches children to be passive and powerless, rather than to be active creators of their own lives and experiences (Wolfe, M., 1986). Strong pressure on children through the educational system can eventually cause frustration and aggression (Toronto Star, 1987). This may result in their withdrawing totally from the school system at the earliest opportunity.

Creating Environments That Are Healthier for Young People

Environments that are healthier for young persons allow them to use their capabilities fully, to more actively shape their own lives. To achieve such environments, we must create new ways of designing and planning environments, which will involve children in the process. This involvement, as well as the environments created, will foster the healthy development of children (Wolfe, M., 1986). It is important for older people to remember that young people can have active, participatory roles in society, and make significant contributions to the world's work and well-being (Boulding, E., 1979).

Intellectual learning is facilitated best by allowing children to figure things out on their own, because doing so fosters remembrance and confidence. We should provide young people with acceptance and recognition for having performed an intellectual feat, rather than correct their errors. Our habit of correcting young people can make them self-conscious of their learning, and they may begin to see the world as a place of danger, from which they must protect themselves (Holt, J., 1987).

There is a growing community of people in Canada who view as desirable the full development of a child's capacity for independent reflection, judgment, decision-making, and action. It cannot be fostered in an atmosphere of coercion, and children suffer greatly from lack of respect and autonomy in schools. A non-compulsory, more broadly-based system of community education is proposed in which people of all ages would participate in an on-going, self-generated process (Priesnitz, W.K., 1987).

Young people's physical and emotional dependence on adults around them makes it very difficult for a young person to interrupt abusive adult behaviour, without considerable help from outside the household. The healthiest environment is one in which adults are not abusive; much work is required to determine how this circumstance can be brought about. In the meantime, a safer, healthier environment for young people would give them more support and more power to escape abuse. Agencies involved in aid to children have a primary responsibility to protect young people; public and professional awareness of all forms of child abuse is essential and must be encouraged, to increase the number of allies (and therefore personal power and control) available to children who are abused (Robinson, A.M., 1983).

To determine what environments are healthy for young people, an abundance of research involving children will be required. Those who conduct or sponsor such research must protect children from harm by limiting the risk to which they may be exposed as research subjects, and children should be empowered, as soon as they are capable of some degree of understanding, to decline participation in research if they so choose. The exclusion of children from the process of consent to involvement in research is one aspect of their more general condition of dependence on adults who are responsible for their care. (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1977).

Research into child abuse may yield answers which may bear on other oppressive and unhealthy environments. Environmental factors and diet may be important (for example, by leading to hyperactivity in a child, whose behaviour in turn stresses an adult's ability to cope beyond its limit, or by impairing the adult's behaviour). Long term studies of abuse victims are necessary, including means of remediating adverse effects (Robinson, A.M., 1983).

The Devaluation of Older People

Like younger people, people who are elderly are often excluded from many aspects of life. They may encounter severe legal and economic handicaps, and social prejudices, that make it more difficult for them to continue to make important contributions to society (Boulding, E., 1979).

Seniors in Canada are starting to organize to help overcome the barriers that separate them from others, and to help governments and others understand their perspectives on current issues, including health, housing, economic and other pressing social policy issues. One Voice - The

Canadian Seniors Network is a newly-formed national, non-profit organization which operates under the belief that Canadians' attitudes towards aging can be changed for the better (Holland, J., 1987). Seniors are focussing on such issues as maintaining good health to increase the quality of life in the later years, maintaining independence in the home, creating change within the system, and developing a supportive social network (Hall, C., 1987).

Characteristics Especially Associated With Aging

Many elderly people are less able to adapt to changes in the surrounding environment than are younger people, and they have more difficulty coping with stress (Adelman, R.C., 1979). Place and possessions have a special significance for the elderly, providing continuity with the past as well as privacy. Many physical changes also accompany aging, such as hearing losses, visual changes, reductions in motor skill, changes in memory and learning, and increased illness (Drader, D., 1982). Elderly people who have smoked previously are even more likely to report poorer health and permanent disability (Hirdes, J.P., 1987).

Because of differences in coordination, balance, muscle and bone strength and other factors, falls are more common occurrences for elderly people than for younger adults, and they are more dangerous when they do occur, often leading to prolonged bed care, complications and sometimes death (Gordon, M., 1982). Chronic care environments involve special attention to handrails and grab bars for additional support (Canada Mortgage and Housing Corporation, 1983). Environmental factors such as indoor air quality can also combine with human factors and building design, to increase the risk of falling accidents (Small, B.M., 1982). The reader is also referred to a more extensive literature on accidents and the elderly: (Calabrese, E.J., 1979) (Blumenthal, M.D., 1980) (Prudham, D., 1981).

The elderly are considered a high-risk group in terms of sensitivity to indoor climatic conditions, including the effects of indoor pollutants such as carbon monoxide (Calabrese, E.J., 1978). There is concern among health specialists about a possible relationship between respiratory diseases and housing conditions such as reduced ambient air temperatures and ventilation rates. Indoor airborne viruses and bacteria are important causes of disabling illness (World Health Organization, 1984).

Healthy Environments for People Who are Older

Elderly people, like any other human beings, need above all to be treated as people of value to those around them and to society in general. Aging itself is a complex issue involving many special needs, and it is tempting to let solutions revolve around these characteristics alone. But truly healthy environments for older people cannot be achieved without consideration of the many other aspects of an aging person's life, including his or her values, language, culture and interests. It is important, for example, when considering health and social services for older people, and when researching the needs of the elderly, to look beyond the mainstream white middle class (Lee, A.J., 1987). Aging gay people, as a specific case, have pointed out that they encounter a system that does not presently allow for lifelong same-gender lovers sharing facilities in an institutional setting (Hall, C., 1987).

For many seniors, some form of illness is a fact of life, and a cure is not always possible. Health management counselling may be required, and seniors should be encouraged to accept responsibility for themselves to the fullest extent possible, including responsibility for creating a lifestyle that is beneficial to their own health. Ideally health promotion education should be directed at the entire population. It should begin well before retirement, and should be presented in a manner that is relevant to today's seniors. A strategy for a healthy lifestyle for seniors would include: ways and means of preventing further illness; nutrition; exercise and activities; wise use of medications and alcohol; and encouragement to become socially active as volunteers and participate in one's community (St. Lawrence, I., 1986).

A substantial number of older people living in rural areas experience the compound problems of aging and coping with physical disabilities, yet they continue to reside independently or with spouses in the community. For these individuals, the social and physical environment plays a vital role in maintaining the balance between their needs for autonomy and their needs for security. Settings perceived as important in their lives vary widely and include many nonservice settings such as homes and social groups (Norris-Baker, C., 1985).

A healthy environment for an aging person whose personal capabilities are diminishing, is one in which the environmental characteristics are well fit to his or her growing needs, allowing the person to maintain independence and personal control in his or her life. If environmental characteristics in residential settings restrict their behaviour, elderly people are less likely to exercise control and independence, which may be vital to maintaining their health (Kalymun, M., 1985).

It is also important for people to have security, continuity, identity and stimulation in their lives. Environmental design that enables the elderly to more adequately meet these needs can be found in a variety of housing alternatives (Combs, E.R., 1985). Designs have been developed for housing units which accommodate health and mobility limitations, ensure affordability and ease of access to public facilities, allow for socialization, communication, and interaction, and provide a sense of home for residents (Canada Mortgage and Housing Corporation, 1983).

The elderly, living largely on low and fixed incomes, share certain housing and support needs with other low-income individuals, such as students. Imaginative options involving both groups may be available which would help elderly people remain in their current homes or neighbourhoods, achieving affordable, age-integrated housing that is secure and supportive of special needs (Wilde, V.L., 1985).

If older people move from homes in the community to congregate housing, their new housing environment may assume the role of the homes they left behind in the community. Older residents of congregate housing tend to personalize their apartments, and should be encouraged to do so, since residents with more decorative possessions tend to be more satisfied with their apartments. Personalization brings a sense of control, and reinforces self-identity while communicating values to others, enabling social ties to develop (Kinney, J.M., 1985). New, improved settings for elderly people have been shown to foster more favorable attitudes, better mental health and social life, diminished interpersonal frictions, greater emotional independence, and fewer health complaints (Carp, F.M., 1967).

2.2.2 Gender

It is abundantly clear that women have historically been discriminated against and exploited in many ways (Innes de Neufville, J., 1981). Despite many changes and improvements, the undervaluing or devaluing of women continues in Canada today. This is, in itself, an unhealthy environment for women. The devaluing of women has also had numerous direct and indirect effects on women's mental and physical health.

Many women are stuck in unhealthy environments, as a result of continuing prejudicial treatment, based purely on their gender. There is no evidence concerning the nature of women, compared to men, which would justify the kind of differential treatment that exists. Rather, we are dealing with an institutionalized oppression, which is historically rooted, but which now requires change.

How Women are Exposed to Unhealthy Environments

One of the unhealthiest environments women are subject to is economic exploitation; many women in Canada are living below the poverty line. Full equality between men and women will require equal pay, equal opportunity, equal valuing of the work of both sexes, equal access to all levels of employment, and equal distribution of all forms of work, including men and women sharing labour such as parenting and housework, which has been seen traditionally as belonging only to females (Balser, D., 1987).

As a result of their segregation into a few occupational categories, large numbers of women in the paid workforce are exposed to many types of conditions which can prove unhealthy to those who are sensitive to them (Gregory, J., 1981). These include clerical workers who are exposed to long hours at video display terminals, poor lighting, excessive noise, toxic substances, and poor ventilation, as well as poorly designed furniture (Stotsky, K., 1987).

Women in retail and service jobs often face chemical exposures such as dry-cleaning fumes or formaldehyde from freshly-unpacked synthetic clothing, as well as physical stresses such as bending, lifting and carrying. Hairdressers working around tonics, dyes, pungent chemicals, and aerosol sprays on a daily basis are susceptible to respiratory problems and skin conditions. Teachers, child care workers and nurses are exposed to a variety of communicable diseases, often exacerbated by poorly ventilated buildings. Health care workers are also exposed to radiation, anaesthetic gases, and various toxic substances (Stotsky, K., 1987).

Regardless of their place of work, stress is a common problem for most women workers. Factors causing stress include heavy workload, lower pay than men for equal work, little job control, lack of recognition, monotonous work, unrealistic deadlines, and the added burden of home responsibilities (Davidson, M.J., 1980)(Stotsky, K., 1987). Many women also find sexism and difficulties with partners to be particular sources of stress (Clark, E.J., 1986).

The majority of women, young and old, learn to live every day with the fear of physical and emotional violence (Balser, D., 1987). Many have been beaten, or are still being beaten, by fathers, brothers, husbands and lovers. Many have been victims of sexual assault, and some are still being sexually abused on a regular basis. Many are regular victims of emotional abuse. Almost 1 million Canadian women from all walks of life have been abused (McLeod, L., 1987). The remainder fear it could happen to them next.

Battered women report a significantly higher level of physical complaints, anxiety, and depression than other women, and are at higher risk of developing pronounced mental health problems (Jaffe, P., 1986). Abused women may also feel isolated, and some attempt suicide. For their children it means terror, pain, behaviour problems, the likelihood that the cycle of violence will be repeated in their future families, and a higher risk of becoming violent outside the family. The typical battered woman is trapped in a cycle of poverty from which there has traditionally been little chance of escape (McLeod, L., 1987).

As health care consumers, women encounter medical procedures that they sometimes find degrading, and many have become concerned that some of the treatments, lab tests and surgical procedures they are advised to undergo are unnecessary and/or dangerous. Doctors may be unaware of negative feelings toward female patients, since medicine's condescending attitude toward women has been thoroughly institutionalized (Mendelsohn, R.S., 1981).

The majority of those using mental health services in Canada are women. However, relatively little attention has been paid to their special or unique needs (Canadian Mental Health Association, 1987). The incidence of depression in women is at least two times as high as in men, yet there is very little discussion in the psychoanalytic or psychiatric literature which addresses itself to this gender difference in any meaningful way (Symonds, A., 1986). During their childhood, women are often rejected because of gender, demeaned, trained to serve others, and taught to repress their own needs. They have been raised in an emotional climate which leads to low self-esteem, insecurity, and depression, and this produces lifelong effects in many women.

Women are living increasingly longer than men, yet older women report more acute and chronic illness and disability than men. They are disproportionately represented in nursing homes, since many women are alone; 25% aged 70 or over have no living children and over 60% of older women are widowed, divorced, or single. Older women have fewer personal financial resources for health care than men. They face age and sex discrimination on the part of many health care providers and are subject to a growing tendency to be seen as a burden to the health care system (Lewis, M., 1985).

Healthier Environments for Women in Canada

The fundamental key to achieving healthier environments for women in Canada is the complete elimination of sexism, and the recognition of women as a decisive force in determining Canada's future. Dismantling sexism need not require increased tension between men and women, if it is recognized during the process that the fundamental cause of sexism is the longstanding institutionalization of oppressive relationships in society, and not the particular individuals today who have been conditioned to perpetuate it. Men are inherently good human beings, and are fully capable of eliminating sexist behaviour (Balser, D., 1987).

Actions directed to improving women's mental health need to be coordinated with efforts to improve women's social status. Significant improvements in women's health and well-being cannot be expected without general gains for women in education, employment, and representation in decision-making roles. Women should also be active participants in the process of developing mental health programs (Canadian Mental Health Association, 1987).

Specific actions which would provide a healthier environment for women in the short-term include promoting the awareness of sexual harassment, increased funding for rape crisis centres and shelters for battered women, the development of more comprehensive standards for occupational health and safety, assisting more women to seek training in the field of mental health planning and policy development, support of initiatives to improve women's social and economic status, and child care (Canadian Mental Health Association, 1987).

A major step forward in improving women's health would result from changing the conditions in our society which perpetuate violence, and particularly violence against women (Balser, D., 1987).

Many women now have two roles; they work outside the home as well as taking responsibility for domestic life. The public services that might help women manage are not given priority by suburbs, which seem to operate under the myth that all women are housewives. Higher density, mixed-use residential environments in city suburbs would give women more options, allowing an integrated life of domestic work, productive work, and leisure (Saegert, S., 1980).

Policy-makers have been slow to recognize the nature and extent of the changes that have taken place in the economic role of women. Policies and programs based on an outdated perception of "the family" and of the relationship between family life and work may be hampering a smooth transition to a new social structure. New patterns of worktime arrangements must make sure that women have access to a fair share of meaningful, dignifying paid work. We must value alternative forms of work such as family responsibilities and voluntarism, but also recognize that for too long women have been engaged in these activities without recognition or pay in addition to their paid employment (Townson, M., 1986).

Early training and environment for females also will require considerable rethinking. Girls and boys receive multiple reminders from adults and from peers as to what are and are not suitable activities for them. It seems that girls are practicing and being prepared for roles in the home, and boys for roles outside. Girls are not encouraged as much as boys, to freely manipulate the environment, and this can limit their spatial abilities and other problem-solving abilities. It is important that all children have the freedom, ability, and confidence to define and carry out their own goals (Hart, D.R., undated).

Unhealthy Environments for Men

Male stereotyping (the 'macho' breadwinning superman image) has led men to both devalue and exert power and control over women, often forcing women into situations that are in many ways unhealthy for them. Men's sexist actions and attitudes in turn create an unhealthy environment for themselves, (though they experience the drawbacks from a position of relative power and privilege). These attitudes cut off a great deal of the closeness, companionship, understanding, intelligence, co-operation and mutual support that can be derived from equal relationships with women. At the same time, men often feel restricted from enjoying the full range of human emotions and skills they are capable of, and from establishing close relationships with each other.

Men are also dehumanized, particularly by being treated as expendable economic and military resources. Exhaustion, poisoning, manipulation, and physical exploitation are common conditions for many working class men in Western society. Men are taught to feel ashamed of protesting and are encouraged to think that endurance is manly. They are discouraged from saying 'this hurts' or 'this is not right' and from exercising power to change unhealthy conditions (Kreiner, C., 1986).

Accepting this role is part of the stereotype, which includes being strong, aggressive, capable of violence, unfeeling, sexually compulsive, oppressive to others, and less able to establish close relationships than women. The threat of being called 'gay' or 'not a man' is used, from an early age, to enforce the achievement of this male image. The elimination of the pressure to emulate the macho stereotype must proceed in parallel with the elimination of sexist behaviour (oppression of women by men), for either process to be successful (Irwin, J., 1987).

Healthier Environments for Men in Canada

Recognition of the full diversity of behaviour that men are capable of, and acceptance of men exploring that full range, would constitute a much healthier environment for males (and for females) in Canada than the present. The steadily increasing involvement of fathers with their children is a positive sign of change in a healthy direction. A significant number of male workers are beginning to restore the balance in their family responsibilities and parenting relationships (Couchman, R., 1986).

Recognizing the rights of women to be equal partners, not only in domestic relationships, but in all other aspects of life, is seen as an important step in major world issues such as the elimination of nuclear arms and the threat of global war (Balser, D., 1987).

2.2.3 Family Type

Gradually changing lifestyles in Canada are creating more diverse forms of households and family types. Single-parent families are common, two-parent families where both parents work are common, and the traditional two-parent family with father-breadwinner and mother-housewife is getting more and more rare. There are both young and old couples living without children. There are young and old singles, living by themselves, or in shared households with other singles or families. There are also gay and lesbian households, with and without children. There are many children who have only one parent, or who split their time between two parents who live separately.

Each family environment may have both its healthy and its unhealthy aspects. Each is also affected by other conditions, such as inequitable rates of pay for women, which make it extremely difficult for single female parents to raise a family, or the availability of good day care for young children, which would make it possible for more than one adult in a household to work outside the home. The price and availability of goods and services, such as housing or transportaion, may in turn influence the type of household arrangements that are formed.

The proportion of Canadians in poverty was 14.9 percent in 1986. The percentage of mother-led households among those below poverty-level incomes has increased from 9.9% to 12.7% since 1979. The poverty rate among single-parent families headed by women has risen from 55.4% to 56.1%, while the number of families has continued to grow (Shifrin, L., 1987).

A recent report illustrates the kind of hazards that may be inherent in a single-parent situation with insufficient money, and how other external conditions such as housing shortages make the situation worse: A single mother with an employment income of $800 a month pays almost half of her income to live, with her two teenaged sons, in a tiny, poorly maintained, second-floor, one-bedroom apartment in Toronto. She recently broke some ribs falling down a steep staircase that has no protective rails, and one son's asthma is aggravated by poor ventilation. The basic services like heat and plumbing are inadequate. While municipal officials are aware of this and many similar rental properties, they fear pressuring landlords too hard in case scarce accomodation will be taken off the market. The tenant has been waiting more than a year for subsidized housing, but is relatively low on the priority points system that ranks the 6,000 families now on the waiting list and feels that she would be in a better situation if still on welfare assistance (English, K., 1987).

The struggle to correct the imbalance in work loads between husbands and wives in two-adult families continues. Women working full time often assume an imbalanced workload, involving work outside the home as well as most of the household tasks. An increasing number of men are beginning to take on more family responsibilities, by participating in part-time work, job sharing, and flexible work-time arrangements (Couchman, R., 1986).

Finding appropriate day-care for children has been a nightmare for many families, and there are many potential consequences of inadequate arrangements. For example, when a child's eligibility for a program is tied to his or her mother's participation in a training program or a particular job, frequent damage to the child's sense of stability and security can result from subsequent changes. Child care services that are child-centred, rather than focused on the needs of adults in the labour force, would provide a more stable environment (Bourne, P.G., 1971).

Up-to-date information is required about the diversity of ways in which people in Canada group themselves together in households for mutual support. The foregoing section is only sufficient to briefly illustrate the kinds of problems which may be discovered. What is needed now is direct contact with, and participation by, people in many different family and household situations, in order to obtain an accurate picture of environmental needs and problems from the point of view of family or household type.

2.2.4 Race and Culture

Canada's multicultural nature allows a wide variety of environments responding to the specific nature and origins of its people. At the same time, many who are not the same race, religion, or cultural background as Canada's dominant population groups have sometimes experienced lingering prejudice, which has had the effect of imposing a less healthy environment upon them than should otherwise be possible in as resource-rich a country as this.

Discriminatory conduct (for example, restricting employment, education or housing opportunities on the basis of race or ethnic origin) itself causes emotional suffering for those who are the object of it (Griffith, E.E.H., 1986). Its secondary effects may impose lower economic status, poor nutrition, unhealthy working conditions, inferior housing, high pollution levels, inadequate education, and other less-than-healthy conditions upon its victims.

Examples of Mistreatment of Cultural and Racial Minorities

Some community colleges discriminate against ethnic minority groups in Canada by severely restricting access to the training and education they need. Problems with admission requirements, lack of bridging programs, failure to acknowledge skills obtained in other countries, too few courses combining learning English with studying a trade, little attempt to reach out to minority groups and invite them to take advantage of educational programs, lack of child-care facilities, and insensitivity of college staff and course content to cultural diversity, have all contributed to decreasing education opportunities for people whose race or culture is in the minority in Canada (Contenta, S., 1987).

Civil suits are pending, even in 1987, against a major urban police force for alleged racism, brutality and false arrest. Misunderstanding of cultural differences, for example, ignorance of what might constitute an offensive remark or action, also contributes to feelings of tension between people of ethnic minority background and law enforcement officials or other authorities (Farber, M., 1987).

Canadian Native people living on reserves have higher morbidity and mortality rates than the rest of Canada's population. Native people who migrated to urban centres have high rates of mental health problems, specific diseases, injuries, infant death and hospital admissions. The low socio-economic status, cultural differences, and discrimination that they find in cities are identified as the primary blocks to good health and adequate health care (Shah, C.P., 1985).

The Union of Ontario Indians has charged that the attitudes taken by the federal government and certain corporations towards the Ojibway people (Anishinabek) and the pollution of their land, have contributed to an unhealthy environment for Ontario Native people (Roy, A.W., 1987). A sulphuric acid factory built in the 1950s within the Serpent River Indian Reserve was abandoned in 1963 for economic reasons, leaving a toxic waste dump containing 120,000 tons of sulphur, calcine and pyrite, which eventually contaminated soils over 100 acres of the reserve (Stokes, P.M., 1985). (The site is only one of several pollution concerns on the Reserve. The Serpent River itself is contaminated with radioactive material from Elliot Lake, and the Aird Bay fishery has been tainted by pulp and paper mill effluent fom Espanola.) The Union spokesman suggests that the original decision to establish such an environmentally deleterious operation in that location was indicative of unhealthy attitudes towards Ontario's aboriginal people, and speculates that if the same situation existed in Southern Ontario, with a constituency of the dominant society middle class Ontarians, the site would have been rehabilitated before 30 years had passed.

Healthy Environments for People from non-Majority Cultures

The healthiest environment for people who happen to be of a race, religion, ethnic or cultural background different from the dominant groups in Canada, is to be treated as first class citizens, in every way welcome to enjoy life and privileges in Canada on a par with everyone else. This includes the choice of living among, working with, and participating alongside everyone else, regardless of origin (Winkel, G.H., 1974).

Every opportunity needs to be taken to directly involve the people who will be affected by an environment, in its design. The unique needs or viewpoints of people in non-majority cultures must be taken into account, if the environment is to be a healthy one for them. For example, the Regina Health Department has hired native Canadian health workers, to help motivate native people to avail themselves of the department's programs, to adopt healthy lifestyles, and to facilitate liaison with the native community and organizations (Hutchison, P.A., 1986).

Cultural differences can create barriers to the use of health care facilities (Shah, C.P., 1985). Some immigrant families find that the social organization and ideology of Canadian health care services are not compatible with their own customs for managing illness. This often leads to non-compliance and ineffective treatment. Practitioners need to include patients and families in decisions that affect their lives, and to negotiate culturally acceptable care with them (Anderson, J.M., 1986).

2.2.5 Illness and Handicap

Many Canadians experience some form of illness or handicap which makes their environmental requirements slightly different from those of others. Sometimes, those with illness or handicap have experienced either overt or subtle discrimination, which leaves them feeling both devalued, and stuck in situations which are unhealthy for them.

An accurate understanding of the physical or mental capabilities and needs of people who are handicapped, by those who are at least temporarily able-bodied, would go a long way towards making healthy environments possible for everyone. An attitude of valuing people who may happen to have either temporary or permanent physical or mental disabilities, would also provide a healthier environment for both the handicapped and the able-bodied.

Variations in Vulnerability to Environmental Factors

It is becoming increasingly clear that there are wide variations among the population in the ability to withstand pollution exposures without impairment. For example, lung function was significantly affected by ambient air pollution in only a portion of a studied population (Kagawa, J., 1980). People who are asthmatics respond differently to sulphur dioxide exposures than non-asthmatics (Witek, T.J., 1984). Exposures to ozone can also produce adverse responses in some asthmatics (Silverman, F., 1979). Nutritional status can also modify the toxicity of environmental pollutants, including that of pesticides and heavy metals (Shakman, R.A., 1974) (Mahaffey, K.R., 1979). Exposure to various pollutants in combination may lead to hazardous impairment of performance in older subjects (Ettema, J.H., 1975).

Children with bronchiolitis, with cystic fibrosis, children who have had asthma during childhood, or who have developed hyperlucency in the radiograph after childhood infection, are all those in whom exposure to industrial irritants or to an inclement environment may be serious. Tobacco smoking also increases the susceptibility of an individual to pollutants (Reid, L.M., 1979).

Indoor air pollution exposures are of concern for populations at higher than average risk, including infants and the elderly, pregnant women and their fetuses, anemic and asthmatic persons, those with compromised cardiovascular or pulmonary function, and siblings of sudden infant death syndrome victims (Ammann, H.M., 1987). When populations with common risk factors under exposure to various pollutants are added up, greater than a quarter of the population is seen to be at elevated risk (Small, B.M., 1984).

While it is clear that not everyone in a given population may be affected adversely by an environmental stressor, it is not clear whether all those affected have any predisposing factors which target them for being the first affected. For example, within the last decade there have been hundreds of reported outbreaks of illness among occupants of new or recently remodelled offices, schools, and other public access buildings. These outbreaks have characteristically affected a large number of individuals, in some cases up to 30-40% of the building's population (Godish, T., 1984). The diversity of different effects among those who appear vulnerable is also important. In outdoor air pollution episodes, a subgroup of people exposed may experience long-term lung damage, but this subgroup may not overlap with those who experienced the most acute symptoms over the short-term. (Stebbings, J.H., Jr., 1979).

The identification and the quantification of the numbers of individuals at high risk in the population is still in its rudimentary stages. This leaves in doubt the percentage of the population that is actually being protected from the toxic or carcinogenic activities of a pollutant, by clean air standards (Calabrese, E.J., 1978).

There are a variety of syndromes which lead to hypersusceptibility, including exposure to high levels of chemicals, nutritional deficiency, and genetic predisposal to environmental chemical sensitivities. In setting standards for environmental contaminants, there must be the awareness that high risk groups are not a small portion of the population, but include virtually everyone from time to time, due to differences in susceptibility for each pollutant, nutritional factors, etc. (Plumlee, L., 1979).

Unhealthy Situations for People With Physical Illness or Handicap

Inadequate knowledge, or warnings, concerning products which may adversely affect a vulnerable portion of the population, present a health hazard to particularly sensitive individuals. For example, the in-home use of paint removers containing methylene chloride results in the absorption of this solvent, which is metabolized to carbon monoxide. Exposure for two to three hours can result in the elevation of carboxyhemoglobin (COHb) in the blood to levels that stress the cardiovascular system. The metabolic formation of COHb continues following the paint-remover exposure, doubling the duration of the cardiovascular stress produced by a comparable COHb level after exposure to CO. Patients with diseased cardiovascular systems may not be able to tolerate this unexpected stress (Stewart, R.D., 1976).

For those who are ill or handicapped, it can be a continual battle to limit the amount of impairment, because many environmental conditions may present hazards to them, that are not as harmful to the general population (Durlak, E., 1987). For example, air pollution can aggravate existing disease conditions or put at higher risk those who are predisposed to ill health (Severs, R.K., 1980). Even very low levels of nitrogen dioxide can cause a significant increase in specific airway resistance for an asthmatic person (Orehek, J., 1976).

People with physical handicaps may also be at considerably increased risk of acquiring further disability, or dying, from environmental conditions that are not recognized as dangerous by temporarily able-bodied people. For example, a recent inquest into the death of a disabled woman was told that there were many things wrong with the highrise where she had lived. The legless widow died as a result of infection from injuries due to falls. Only two of four main entrances were usable by those in wheelchairs, while one ramp was dangerously steep, too narrow, and lacked handrails, according to a study of the building. There were many more access-oriented problems in the building, which was originally not designed with the disabled in mind (Sutton, R., 1987).

Non-ambulant and semi-ambulant people are at particular risk in emergencies such as building fires. Knowledge of techniques of preparing, lifting, and carrying persons with various disabilities is required in emergency evacuations of buildings, as it is often difficult for untrained rescuers to motivate certain people to evacuate (Johnson, B., 1983).

When a child with severe chronic mobility problems becomes too heavy or too cumbersome to lift and to carry, parents must consider removing architectural barriers in the home. Practical and psychological difficulties frequently cause them to postpone making such changes until a crisis occurs. Practical difficulties include lack of resources, gaps in services, and a general disregard by medical personnel of how environments affect behavior. Psychological difficulties, which have so far received little attention, mainly stem from conflict between the parents' desire for an idealized house and their child's functional requirements, as well as from the parents' desire to appear as normal as possible to their neighbors. Adapting the home means accepting the permanence of the disability, and making the family's disability public — stigmatizing the house, and thus its occupants (Lewis, B.E., 1985). For further discussion about building accessibility for the handicapped, the reader is referred to (Margulis, S.T., 1981) and to the report index.

New environmental hazards are also being discovered within common household environments, for people who have impaired or suppressed immune systems. For example, types of fungus that once only affected foods such as tomatoes and peaches are turning up as the cause of some diseases in immune-suppressed individuals (Dunlop, M., 1987).

There is also a complex relationship between stress and other emotional factors, and physical disease. For example, it is known that emotional factors can trigger or worsen asthma in a physiologically or biochemically predisposed individual. The disease process also has a very definite emotional toll on the individual with asthma, as well as on other members of the family. Achieving an optimum environment and optimum functioning while subject to illness may require complex psychological adaptations, alterations in lifestyle, and in family and personal interactions. Emotional factors and psychological problems which accompany or result from having asthma can be a major impediment to progress toward health (Nieder, J., 1986).

For people who are severely ill, the question also arises as to whether modern technology has made it possible to keep people alive past the point at which life has ceased to be worth living. Some argue that everyone should have the right to control the ending of their own lives (Seguin, M., 1987). What constitutes a 'healthy' environment for those who are dying is not as clearcut a question as it can be at earlier stages of life, yet it may be of concern to everyone in Canada, at some point in their lives.

Unhealthy Situations for People With Mental Illness

Present mental health care systems, while endeavouring within available resources to help and cure people with mental illnesses, do fall short, in many areas, of providing truly health-promoting environments for people who have been categorized as emotionally disturbed. Mental health system consumers have expressed feelings of cynicism and powerlessness resulting from the overwhelming paternalism directed towards them, as clients of the system. Traditional psychiatric labels make it almost impossible for them to be seen as human beings (Hutchison, P., 1985).

Many people who have been mentally ill need independence but also require a great deal of support to become re-integrated into community life. They may periodically need some form of shelter or refuge, but they believe the imposing controls and practices of institutions and hospitals are generally inappropriate. The rehabilitation and welfare systems tend to trap many into a life of poverty and dependence, which result in feelings of low self-worth. Lack of appropriate housing conditions and work opportunities contribute to lack of dignity, income, and security (Hutchison, P., 1985).

Mental health services cannot adequately respond to the needs of the mentally ill without recognizing the harmful effect that a variety of social, environmental, physical, psychological and biological factors can have (Insel, P.M., 1983). For example, some pesticides, heavy metals, pollutants, foods, food additives, and drugs have been linked with unexpected behavioral disturbances, including paranoia, hyperactivity, anxiety, and hallucinations (Philpott, W.H., 1980) (Johnson, K.A., 1982). Careful control of a person's environment has commonly been ignored as a potential benefit in the treatment of mental disorders.

Healthier Environments for People Who Are Mentally Ill

The majority of those using mental health services are women. It would be appropriate to assist more women to seek training in the field of mental health planning and policy development (Canadian Mental Health Association, 1987).

In designing for the developmentally disabled, we also must design for those parts of people or their daily lives that are not disabled. Otherwise, the environments we design, both socially and physically, can help to create more disabilities (Wolfe, M., 1976). The media have portrayed mental illness and the mentally ill in a disparaging manner (Day, D.M., 1986), preventing others from seeing them as human beings. The hopes of people disabled by mental health problems are not unlike those of other Canadians; their use of formal mental health services does not mean that other things in life, like making a contribution to family, friends, work and neighbourhood, are any less important (Hutchinson, P., 1986). The stigma of mental illness can present many problems for the chronic psychiatric patient, for example, reduced job availability (Kirsh, S., 1983). It is important to involve and support individuals with a disability, to be part of the everyday things which many of us take for granted, including community activities.

Often, mentally disabled persons are either segregated into expensive formal health care and rehabilitation systems, or discharged, with limited support, into unprepared communities. Increasing concern has been raised about the fate of the de-institutionalized patient in the community, including reports of inadequate housing, life skills, activity and work preparation programs, as well as staff overload and frustration at lack of resources (Toews, J., 1982). A healthier social environment for mentally disabled persons will require more community investment, so that at some point, they can live with maximum reliance on the resources found or created within their local environment (Pape, B., 1987). Community-based rehabilitation offers a vision of citizenship to the mentally disabled, rather than one of control and exile (McKnight, J.L., 1983) (Trainor, J., 1984).

New initiatives in mental health advocacy have focused on helping former and present users of mental health services participate in planning for a better mental health system (Wolfe M., 1976) (Church, K., 1986). The reader is also referred to additional references for further discussion of environments suitable for those who have been diagnosed as mentally ill: (Stewart, D.W., 1982) (Campbell, D., 1986).

Appropriate Environments for the Chemically Sensitive

Over the past decade, the phenomenon of environmental sensitivity has been receiving increased attention. Sensitized individuals become reactive to a wide variety of low-level air contaminants in their immediate environment (Dickey, L.D., 1976) (Rea, W.J., 1979). Once this process has begun, common indoor and outdoor environments appear to exacerbate symptoms, and chemically less-contaminated environments appear to be therapeutic (Selner, J.C., 1986) (Daglish, S., 1987). There is some indication that the proportion of hypersensitive individuals in the population is increasing. The World Health Organization has recommended that special environmental requirements for the protection of the affected groups should be assessed (World Health Organization, 1984).

One of the most difficult aspects of dealing with hypersensitivity is the prevalence of negative attitudes among the less-sensitive population, towards individuals who find themselves highly reactive to physical environmental factors. In the words of one individual coping with the illness: "The most demoralizing and frustrating experience ... is that, while being seriously ill, weak, exhausted, confused, in pain, and isolated, one must also fight spouse, children, extended family, neighbors, friends, community, all levels of government, doctors, hospitals, social services, OHIP, OMA, psychiatrists, employers, insurance companies, pension and/or welfare agencies — in fact, the whole world — in order to survive" (Hall, M., 1987).

Many seemingly innocent practices present unexpected hazards to people who have become temporarily hypersensitive, including the use of perfumes built into stationery, advertising and periodicals, and the common use of scented cosmetics, body, and clothing care products by both men and women (Hall, M., 1987) Unannounced pesticiding of apartment buildings and offices can render a previously safe location totally intolerable.

The present atmosphere of general ignorance about hypersensitivity diseases, and even about allergy, which has been studied for a longer time, is an unhealthy and a dangerous one for both allergic and hypersensitive individuals. It leads to feelings of hopelessness at being misunderstood, and often to extreme isolation, as friends and families withdraw, not knowing how to deal with the environmental needs of the afflicted person (Hall, M., 1987). Health care environments have often proven to be particularly hazardous to the asthmatic and/or chemically sensitive individual seeking emergency treatment (Durlak, E., 1987). For example, many care-givers and hospital workers are unfamiliar with the potential effects on sensitive individuals of volatile chemicals commonly used in hospitals.

The food and chemically sensitive individual will sometimes have difficulty in maintaining a healthy and supportive social network for himself or herself. Some will have childhood histories of learning problems and deficits in appropriate social skills, possibly relating to early malfunction or specific physiological systems. Behaviours commonly exhibited include increased activation, an increased probability of frustration, decreased attention span, perceptual problems, and memory deficits (O'Banion, D.R., 1981). Social skills may be required, however, to negotiate environmental changes that represent, to date, the best means of reducing the individual's hyper-reactivity.

2.2.6 Orientation and Lifestyle

There are adverse mental, physical and social consequences to people who are lesbian, gay, or bisexual, from living in an environment of prejudice against their orientation and lifestyle. The literature is clear that it is the oppressive environment and its consequences, and not the choice of loving someone of the same gender, that is the causative factor in their particular health problems.

Homosexuals are probably the most frequent victims of hate-motivated violence, and are targeted for assault, verbal intimidation, and vandalism more often than blacks, Hispanics, Southeast Asians, and Jews (Finn, P., 1987). The coping strategies of lesbians and gay men in reaction to such oppression in everyday life, and the damages suffered by them, are in many ways similar to those of Jews and blacks in response to anti-Semitism and racism (Adam, B.D., 1978). People survive domination through resistance, accommodation and compliance.

The Devaluation of Lesbians and Gay Men

Gay oppression is an integral part of society's pressure on all men and all women to conform to rigid stereotyped images. We are told, as we grow up, what men and women should be like. If a boy or girl strays from the stereotypes and makes independent choices, he or she faces rejection, sometimes violence, and often the accusation that he or she is gay, "not a man", or "not a woman" (Irwin, J., 1987).

To maintain the threat of prejudice against everyone, overt prejudice and even violence has been directed against individuals who choose to engage in loving relationships with people of the same gender and/or in same-gender sexual practices (Finn, P., 1987). All other human characteristics, skills, goals, and needs of gay-oriented individuals, which they share with heterosexualy-oriented individuals, are often completely ignored in favour of focussing attention on the differences in their choices of lifestyle.

How Lesbians, Gay Men and Bisexual People are Mistreated

A homosexual adolescent is often placed at a greater distance from his or her parents than his heterosexual counterpart. For those who reveal their sexual orientation, the family response is often not supportive. In the absence of a support group, the adolescent feels alone and isolated (Paroski, P.A., 1987). Negative reactions of family and peers toward a young person's homosexuality, damaged self-esteem, the desire to be with gay-identified peers, and exposure to street life are important factors predisposing gay men to a higher risk of involvement with prostitution, alcohol abuse and drug abuse. There is also potential for intense family discord, and physical and/or emotional abuse when homosexuality is first revealed (Remafedi, G.J., 1985).

Many men who ultimately decide that they are homosexual or bisexual have at some point in their lives married or established continuing relationships with women. Many of these men have also fathered children. The life of the gay father is often fraught with fears and anxiety involving marriage breakup, access to children, discrimination against himself or his family, and the process of 'coming out' as gay (Heath, L., 1981).

The current epidemic of acquired immune deficiency syndrome (AIDS) has led to many instances of overt discrimination against gays, including social ostracism, and even the deprivation of various rights such as housing, employment, transportation, and funeral services (Douglas, C.J., 1985). It has also highlighted the need for equitable legislation regarding spousal rights and distribution of property upon death, for gay couples (Adam, B.D., 1987).

Groups fighting for gay rights stress that public policies often reflect and reinforce homophobic attitudes, particularly in such areas as education, family law, police/community relations and the administration of health (Coalition for Gay Rights in Ontario, 1986). Other human rights issues for lesbian and gay men and women include child custody, tax laws, municipal zoning regulations, social welfare, insurance and employment. Quebec, Ontario and the Yukon Territory have added "sexual orientation" protection to their human rights codes. A number of municipalities have also instituted limited forms of protection and many unions have won such protection in their contracts. At the same time, some governments, social agencies, businesses, and landlords continue to deny lesbian and gay individuals basic civil and human rights (Kinsman, G., 1987).

Stigmatization of homosexuality has also contributed to the invisibility of this aspect of their lives, for many men and women in Canada who choose a gay, lesbian, or bisexual orientation (Adam, B., 1987). There is an immense cost suffered by those in hiding, in terms of psychological suffocation, and in terms of the fear that public identification of their orientation will invite prejudice and loss of those freedoms, privileges and opportunities normally taken for granted by the heterosexual population.

Since the gay and bisexual population is under these circumstances neither easily identifiable nor enumerable, information-gathering and information dissemination about health and other issues is difficult (Soskolene, C.L., 1986). At the same time, it has been a matter of life and death for gay and bisexual men, as a high-risk group, to obtain accurate information about the transmission of Acquired Immune Deficiency Syndrome (AIDS) (Allen, M., 1987). Prejudices against homosexuality have led to obstacles being presented against distribution of literature about 'safer sex', a term used to describe sexual practices which minimize the risk of transmission of sexually-transmitted diseases such as AIDS (Adam, B.D., 1987). Information about sexual decision-making, personal hygiene, prevention of sexually-transmitted diseases, and substance use, can be life-saving for the young homosexual in particular (Remafedi, G. J., 1985).

How Lesbians, Gay Men and Bisexuals Differ from Heterosexuals

The differences between gay-oriented and non-gay-oriented people are not highly visible. Unless you know someone fairly well, it is difficult to know for sure if he or she is lesbian or gay, bisexual or heterosexual in orientation. Lesbians and gay men are conscious of erotic and affectional attractions to people of the same gender. They may or may not also have attractions to, and sexual relations with, people of the opposite gender, but their preference is for closeness and sexual relations with persons of the same gender (Clark, D., 1987).

Bisexual people have erotic and affectional attractions to people of both genders, and prefer to have, during their lifetime, closeness and/or sexual relations with individuals of both genders. Heterosexual people are conscious of erotic and affectional attractions to people of the opposite gender. They may or may not also have attractions to, and sexual relations with, people of the same gender, but their preference is for closeness and sexual relations with persons of the opposite gender.

With the exception of having a different gender-preference, lesbians, gay men and bisexuals all have the same kinds of needs and desires for everything in life (family, food and nutrition, clean air and water, shelter, clothing, companionship and support, achievement and self-worth, life goals, self-expression, sexuality, parenting, community, communication, information, relaxation, excitement, health care, and so on), as every other human being. At the same time, there is as wide a diversity among lesbians, gay men and bisexuals in Canada as there is among heterosexuals, in their individual natures and their lifestyles.

Difference In Vulnerability to Environmental Factors

The AIDS crisis at first made it appear that homosexuals and bisexual men were more vulnerable than others to infection. The predominance of gay and bisexual men among infected individuals turned out to be due to the virus having been first introduced to North America into the gay population, and to the rapid transmission of the virus through the exchange of bodily fluids via anal intercourse among gay men.

Once the AIDS virus began spreading into the heterosexual population, its transmission through exchange of fluids in heterosexual sexual activity also became apparent. Recent shifts in the nature of sexual activities among homosexual and bisexual men have begun to reduce the risk of transmission of the disease among them, through restriction and modification of those practices which would have transferred bodily fluids, and substitution of "safer sex" practices (Adam, B.D., 1987).

The specific life experiences and the nature of oppressions experienced by lesbians, gay men and bisexuals may have a strong bearing on the suitability or health of particular environments for them, in the absence of any changes in the overall incidence of prejudice in our society. The design of gay-supportive housing, for example, would differ from present designs (which do not take lesbian and gay orientations into account) since gay individuals do not yet enjoy the same freedoms of association or affection in public spaces without fear of abusive behaviour by non-gay people (Bradley, E., 1987).

A Healthier Environment for Lesbians, Gay Men and Bisexual People

The healthiest environment for those in Canada who choose a lesbian, gay or bisexual orientation and lifestyle is one of acceptance and respect, protected by explicit legislation guaranteeing individual rights and freedoms.

Critical in the termination of unhealthy conditions is the interruption of overt prejudice against homosexuality in Canada. Prejudice breeds on ignorance and inaccurate, stereotypical images of people. Gay oppression has remained intact in Canada because lesbians, gay men, and bisexuals, for reasons of survival, are largely invisible in our society. Non-gay people therefore have little or no accurate information to counter the stereotyped and false images of homosexuality with which they were brought up (Clark, D., 1987).

Protection of the civil rights of lesbians and gay men is a necessary precondition for lesbians and gay men to have equitable access to both civic rights (the rights to the impartial administration of civil and criminal laws in defense of property and person) and political rights (including freedom of speech, of press, of assembly, to petition for the redress of grievances, and to join with and be identified with other persons for common political goals). Exercising all these rights requires public actions, which are impossible for a person who must remain invisible, hidden and secreted, in respect of his or her minority status, as a condition for maintaining his or her livelihood and housing (Mohr, R.D., 1985).

Little attention is given in medical school curricula to providing appropriate health care for the 5-10% of the population whose orientation is homosexual (Bauman, K.A., 1985). Health care providers need to be aware of the sense of isolation, the process of hiding one's homosexuality, the conflicts that homosexual adolescents have regarding their lifestyle, and the need of lesbians and gay men for non-judgmental health care (Paroski, P.A., 1987).

2. Healthy Environment Issues (continued)

2.3 By Environmental Resource and Social Condition

The eight subsections following give a partial sampling of environmental factors, both physical and social, that affect health. Depending on what was available to us in the literature, we have tried to include both the positive and the negative: the environmental resources and social conditions that seem to foster good health, as well as the environmental and social hazards that contribute to ill health.

One message from the literature is that while many of the conditions we discuss may be necessary for good health, none is by itself sufficient. Human beings are very adaptable, but not so adaptable that we can get away with forgetting major needs, whether they be physical, social, or psychological, without paying some price in health and wellbeing.

2.3.1 Safety

Injury is among the most important public health problems, both in terms of numbers of people affected, and in terms of the potential effects, which include permanent disability and death. Preventing injury extends far beyond awareness of precautions which will reduce the risk of accidents within existing environments. It requires that we take a conscious look at selecting the technologies we use, taking potential risk of injury into account. High injury rates are associated with road vehicles, guns, farm machinery, sports equipment, cigarettes, and many other consumer products (Robertson, L.S., 1986).

Children are particularly vulnerable to accidental injuries, often being unfamiliar with the extent of hazard involved in situations adults have learned to live with relatively safely (Garling, T., 1985). Understanding the child's perceptions of hazards in familiar environments may be critical to making better progress both in product design and in safety education (Sheehy, N.P., 1985).

Egocentric thinking on the part of able-bodied adults who have maximum power to structure their environment, may leave other people, such as younger people, the elderly, or the disabled, at more risk. A failure to recognize the different perceptual capabilities, decision processes, motivations, etc. of a particular group can lead to the provision of environments which present no great risks to a healthy adult, but which can be extremely hazardous to others (Stratton, P., 1985).

Careful thinking may be required to better anticipate physical and chemical hazards which may only arise under emergency conditions. For example, an electrical fire in a large commercial building caused oil containing PCBs to spill into the blaze. The resulting toxic gases included dioxin, which is extremely hazardous. Contaminated soot was dispersed throughout the building by the ventilation system (Yulsman, T., 1985).

2.3.3 Clean Air

One important resource which is an indispensable part of a healthy environment is clean air. The literature contains a great deal of discussion of the contamination of air, both indoors and outdoors, by various chemical pollutants. The evidence is very clear that contaminated air can present some risk to the entire population, and a much higher risk to a subset of the population, who appear to be more susceptible than others.

Information about the health effects of low-level contamination of air has not yet been widely distributed, though the effects are well documented. Testing for the effects of contaminated air on people is not yet a widely accepted practice within the health care systems in Canada.

Much of the basic information about the adverse health effects of polluted air, and of the therapeutic and diagnostic role of clean air, has been presented and discussed in earlier sections, from the point of view of a particular setting, such as the home, the school or the workplace. The information below summarizes additional facts about the nature of the contaminants in air, the sources of these contaminants, and their health effects, independent of the setting.

Contaminants in Outdoor Air and Their Effects on Health

Both particulate and gaseous contaminants are now routinely measured in outdoor air at various points across Canada. Pollutants that predominate outdoors include sulphur oxides, ozone and related oxidants, trace metals, halogen compounds, petrochemical compounds, and pesticides (Lebowitz, M.D., 1983). There are many sources for the pollutants found in outdoor air, including industrial activity, transportation, utilities, municipal incineration, home heating, and agricultural activities.

Various studies, in Canada and beyond, have established a link between exposure to common outdoor pollution and increased incidence of health problems. For example, one Ontario study found highly significant associations between excess admissions to hospitals for respiratory disorders, and the levels of sulphur dioxide and ozone, during the months of July and August over several years in the mid-to-late 1970s (Bates, D.V., 1983).

In patients with asthma and hyperreactivity, small concentrations of a pollutant like sulphur dioxide can cause substantial and clinically important respiratory effects. In acute severe episodes of air pollution, predominantly people with pre-existing heart and lung disease show an increase in mortality (Simonsson, B.G., 1986).

There is a close association between air pollution and various respiratory indices in children, and smoke appears to have a greater effect on health than sulphur dioxide. It is likely that initial effects on children's respiratory indices will show up in areas with an annual mean concentration of sulphur dioxide and smoke of 50-200 ug/m 3 (Colley, J.R.T., 1980). Children living in highly polluted areas show a higher prevalence of cough and other chronic respiratory symptoms, and decreased lung measures, compared to children in less polluted areas (Kerrebijn, K.F., 1975), (Sugita, K., 1981).

The immune system may be considered to be a series of mechanisms for adapting to an ever-changing and hostile environment. Any teratogenic effect early in embryonic life can have profound consequences on the immune system of the developing infant. A number of chemical pollutants are known to injure the immune response of the fully developed organism. The human fetus and newborn are especially susceptible to substances like lead, cadmium, nitrogen dioxide, and sulphur dioxide (Bellanti, J.A., 1974).

There is little data on the health effects of mixtures of pollutants. Some experiments indicate there may be synergistic effects. For example, repeated inhalation of mixtures of nitrogen dioxide and ozone (at relatively high levels) was more effective than the single gases, in reducing resistance of animals to infection (Ehrlich, R., 1977).

Many industrial processes utilizing or producing inorganic materials release metals (usually in the form of oxides or salts) into the environment. Significant quantities of metals are also released from incinerators burning industrial and municipal waste. Metals are also released from combustion sources such as fuel burning for heat and power (including cars) (Yocom, J.E., 1983). Of particular concern is the effect of lead, since lead levels formerly considered safe have recently been shown to increase abnormal behaviour, cause learning difficulties and reduce intelligence. Children can absorb enough lead to impair their performance on tests of reasoning, coordination, intelligence and reading. Some symptoms of lead toxicity are: hyperactivity, perceptual disorders, mental retardation, fatigue, irritability, temper tantrums, learning disabilities, speech disturbances, perceptual motor dysfunctions, and emotional or behavioural problems (Schauss, A., 1980).

Another review emphasizes that particulate air pollution, even at current levels, could be of concern for public health and that new research is needed to assess the effects of acidic aerosols and oxidants involved in the formation of acid precipitation (acid rain), on human health in Canada (Ozkaynak, H., 1985). Health and environmental organizations are also becoming very concerned about potential health effects of municipal projects such as garbage incinerators (Poole, R., 1987).

Various additional researchers report significant effects of inhaled air pollution on health:

- effects of ozone (Jaffe, L.S., 1967).
- effects on body and mind functions (Laverne, A.A., 1970)
- effects of carbon monoxide on mortality (Hexter, A.C., 1971)
- effects on cardiovascular and other systems (Finkel, A.S., 1976)
- effects on height and bones in children (Thielebeule, U., 1980)
- effects on the respiratory tract (Phalen, R.F., 1981)
- effects of low levels of lead intake (King, E., 1982).
- aluminum, iron, & lead in respirable particles (Tosteson, T.D., 1982).

Contaminants in Indoor Air and Their Effects on Health

Urban residents typically spend more than 90 percent of their time indoors. The indoor environment is likely to include exposure to radon daughter nuclides, formaldehyde, carbon monoxide, nitrogen dioxide, respirable particulates and asbestos, tobacco smoke, microorganisms, and aeroallergens, organic vapours, mineral and synthetic fibers (Lebowitz, M.D., 1983), (Spengler, J.D., 1983). Indoor exposure may constitute 80-95% of the total exposure for some pollutants (Dudney, C.S., 1981). Recent investigations have also shown that as much as 10% of the pollutants exhausted from a building may commonly reenter the building rather than be dispersed to the atmosphere (Reible, D.D., 1985).

The health effects of formaldehyde include: irritation to the skin, eye, lung and mucosal surfaces; sensitization; alteration in irritancy threshold; mutagenicity; and potential carcinogenicity (Gupta, K.C., 1982), (Nethercott, J.R., 1982), (Wartew, G.A., 1983). Indoor levels of formaldehyde, due primarily to off-gassing of building materials, may range from less than 0.01 ppm to approximately 3 ppm (Ulsamer, A.G., 1982). Canadian guidelines propose 0.1 ppm as the upper limit in residential situations. Particle board, a common building construction material made of wood shavings held together with a urea-formaldehyde glue, continuously emanates formaldehyde (Andersen, I., 1975). Formaldehyde levels indoors increase with temperature, and decrease with the age of the source (Moschandreas, D., 1986). (See also section 2.1.1 "At Home").

The respirable suspended particulate levels generated by tobacco smoking overwhelm the effects of ventilation and inflict significant air pollution burdens (Repace, J.L., 1980). In rooms with even moderate smoking, a great deal more fresh air is required, even for nonsensitive occupants to judge the comfort level acceptable, than in nonsmoking conditions (Cain, W.S., 1982).

Statistically significant dose-response relationships between exposure to tobacco smoke and loss of life expectancy have been calculated. Even a limited amount of exposure to tobacco smoke carries a greatly increased risk of premature mortality (Repace, J.L., 1981). More than 30,000 Canadians die each year from smoking-related illnesses, including cancer, cardiovascular disease, and pulmonary disease. While overall tobacco use has declined in Canada, a number of disturbing trends persist: smoking onset among 12 to 14 year olds has remained high; the prevalence of smoking among young women (20 to 29) is increasing; and regional and socioeconomic differences in smoking rates continue to exist (National Program to Reduce Tobacco Use, Consultation, Planning and Implementation Committee, 1987).

In the presence of tobacco smoke, many normal nonsmokers experience eye and throat irritation, headache, rhinitis and coughing. Allergic persons report wheezing, sneezing and nausea as well. Particularly acute symptoms may be found in infants, children, persons with cardiovascular or respiratory disease and wearers of contact lenses (Repace, J.L., 1980). Passive exposure to tobacco smoke can increase heart rate, systolic and diastolic blood pressure, and venous carboxyhemoglobin. People who are prone to angina may experience typical symptoms, including a reduction in heart rate and systolic blood pressure at onset of angina (Aronow, W.S., 1978). Nonsmokers breathing ambient tobacco smoke are at significantly increased risk of illness and mortality than those not exposed (Repace, J.L., 1982).

Houses causing environmental illness problems have higher concentrations in the air of Volatile Organic Compounds (VOC) than houses without problems. Below 0.6 mg/m3 no irritation by VOC can be expected. Above 2 mg/m3 VOC are expected to cause irritation. Above 5 mg/m3 irritation and decreased mental performance may occur (Molhave, L., 1982), (Molhave, L., 1986).

Indoor air, whether in commercial, industrial, or residential buildings, typically contains levels of polychlorinated biphenyls (PCBs) at least 1 order of magnitude higher than outdoor levels. Defective fluorescent light ballasts (from an era in which PCBs were used) can emit PCBs and are an important source of indoor atmospheric contamination (MacLeod, K.E., 1981).

A very broad range of concentrations of radon is observed inside buildings, particularly in homes, and even the average concentration has an estimated risk that is large by comparison with most environmental risks. (Nero, A.V., 1986). Further discussion of the problem of radon gas and radon daughter products in homes is found in section 2.1.1. "At Home". Additional references dealing with radon include: (Jonassen, N., 1981), (Letourneau, E.G., 1985).

Bacterial and viral disease can sometimes be transmitted from person to person on indoor air, particularly when poor ventilation allows indoor concentrations to build up. Devices such as humidifiers may be sites of culturing of bacteria, as can fan coil units (Hambraeus, A., 1986), (Johnson-Lussenburg, C.M., 1986). The most serious consequences on human health are usually observed in especially susceptible populations, but unexpected allergic responses ranging from trivial to life-threatening can also result among the general population (Tobin, R.S., 1986). The growth of Legionella bacteria, which can cause life-threatening illness, is amplified in such things as cooling towers, humidifiers, and hot water systems. It sometimes incubates indoors in warm and/or standing water found in humidifiers, shower heads, and air conditioning ductwork (Besch, E.L., 1981).

Indoor air always contains viable mould spores, but in buildings that do not generate their own sources of mould, the numbers are usually low and the species found are similar to those found in outdoor air (Hambraeus, A., 1986). Building materials of high cellulose and low nitrogen content that become moist and are subjected to temperature fluctuations can provide ideal conditions for types of fungal growth that produce macrocyclic trichothecene toxins, which can cause illness and can be immunosuppressive (Jarvis, B.B., 1986). Mycotoxins have been associated in particular with certain types of thermal insulation (Scott, P.M., 1986). In buildings with flat roofs, water damage can lead to subsequent microbial growth, which may be related to complaints about indoor climate (Gravesen, S., 1986).

Sensations of odour and irritation (the effects experienced by people due to stimulation of the olfactory and trigeminal nerves) may be the first warning signals a person receives that the atmosphere is contaminated. While scientific and objective measurement of the environment seems generally favoured over potentially subjective information received from the people living in the environment, human senses still make a crucial contribution to the analysis of indoor air. It is still the effect of indoor air on human beings, as they experience it, which provides most of the norms for indoor air research (Engen, T., 1986).

One neglected source of both indoor air pollution and personal intake of pollutants is clothing. The additives and contaminants which occur in textile fibers vary widely. For example, synthetic fibers such as nylon and polyester contain trace amounts of contaminants such as catalysts and deactivators which remain after the synthesis of basic polymers. In addition, there are frequently a number of materials which are added to perform specific functions, such as traces of metals or metal salts, and antistatic agents and flame retardants. After the fibers are converted into fabric form, other substances are applied to act as lubricants, sizing agents, antistats, bleaches, wetting agents, dyes, and durable-press treatments (Barker, R.H., 1975), (Finkel, J.M., 1979).

The effects of these agents on human health has not been well studied, although allergic skin reactions, particularly due to formaldehyde in new clothing, have been reported (O'Quinn,Silas E., 1965). Recent research suggests that cardiovascular effects such as premature ventricular contractions may be more frequent in people wearing synthetic clothing, compared to those wearing cotton (Seyal, A.R., 198?).

Additional references dealing in detail with indoor air pollutants and their health effects include: (Bridbord, K., 1975), (Adkinson, N.F., 1977), (Muittari, A., 1978), (Schaumburg, H., 1978) (Andersen, I., 1979), (Molhave, L., 1979), (World Health Organization, 1979), (Hollowell, C.D., 1980), (Beall, J.R., 1981), (Hollowell, C.D., 1981), (Committee on Indoor Pollutants, National Academy of Science, 1982), (Wigle, D.T., 1982), (Rittfeldt, L., 1984).

Effects of Low-Level Contaminants on Sensitive Individuals

Overexposure to commonly used environmental chemicals appears to have been responsible for the development, in some individuals, of recurrent signs and symptoms of inflammatory type diseases. Repeated episodes of illness are triggered by ambient chemical fumes in the outdoor air and home environments. Once an individual is sensitized to a solitary chemical it is apparent that continued exposures result in a spreading phenomenon, involving sensitivity to other types of chemical exposures. Once this spreading occurs, reactions then proceed upon minute exposures (Rea, W.J., 1978). Exposure to environ mental pollutants has also been clinically reported to provoke cognitive, emotional, and behavioural reactions in sensitive individuals (King, D.S., 1981).

A period of time in a relatively fume-free and particle-free environment has been used successfully to clear the majority of symptoms and signs in chemically sensitive individuals without the use of medication. Double-blind rechallenge with ambient dose levels of synthetic chemicals is used to reproduce and verify most of the symptomatology (Rea, W.J., 1978).

Additional discussion of chemical hypersensitivity can be found in Section 2.2.5 "Illness and Handicap".

2.3.3 Food and Water

Achieving health for all in Canada cannot be achieved without acknowledging and addressing the reality of Canada's food and water supplies. Food and water are far more complex than Canada's Food Guide would have our children believe. Nutritional needs vary widely from person to person, as do individual sensitivities to different diets and to various deliberate additives as well as inadvertent contaminants in most of Canada's food supplies. Water in some areas is highly contaminated and in others, though treated and deemed safe, may contain hundreds of trace levels of various toxic chemicals, the combined and long-term effects of which, at these levels, are totally unknown.

The health of our food and water supplies is dependent in complex ways on what is happening in the ecosystem. For example, high levels of aluminum in soil, and acid rain, which can leach aluminum from the soil, tend to increase the level of aluminum, and decrease the amount of selenium, in locally grown plants (Boegman, R.J., 1984).

Individual Differences

Recent evidence shows a complex interaction between nutrition and toxicity of ingested or inhaled pollutants. Vitamins, minerals and other nutrients can have both positive and negative effects on a person's sensitivity to the adverse effects of pollutants (Calabrese, E.J., 1980). For example, nutritional deficiencies of calcium and magnesium can enhance the absorption of aluminum, a neurotoxic metal (Boegman, R.J., 1984). People's nutritional intake and ability to absorb and utilize nutrients varies widely, depending both on lifestyle, diet, age and many other factors.

The variation in people's ability to tolerate individual foods is only recently becoming known and being utilized in diagnosing symptoms which are not responsive to other medical treatments (O'Banion, D.R., 1981). Even inflammatory cardiovascular diseases, including spastic vascular phenomena such as migraines and other vascular headaches, angina due to coronary spasm and Raynaud's disease, are responding in some cases to dietary and environmental management (Rea, W.J., 1987). For some people, dietary changes also appear to be able to remediate emotional distress (King, D.S., 1981), (Christensen, L., 1985).

The human immune system can tolerate and adapt to chemical exposures to a point, but that point is often exceeded, and the immune system can fail, resulting in symptoms and disease (Maulfair, C.G., 1987). The degree of adaptability will depend on many personal factors and individual circumstances.

Deliberate Food Additives: Not For Everyone?

Information on individual reactivity to various food additives is making it very clear that safety of additives cannot be universally guaranteed (Kon, S.H., 1978), (Miller, J.B., 1978). This makes labelling critical, and for some people, of life-and-death importance.

British research underway indicates that perhaps as many as 15% of people feel they may be adversely affected by food additives. Actual incidence of reactions to food additives is being investigated. One way to confirm a suspected reaction to a food additive is to eliminate it from the diet for a few months (Daglish, S., 1987).

Sulfites have been widely used as preservatives in the food and pharmaceutical industries. In the United States more than 250 cases of sulfite-related adverse reactions, including anaphylactic shock, asthmatic attacks, urticaria and angioedema, nausea, abdominal pain and diarrhea, seizures and death, have been reported, including 6 deaths allegedly associated with restaurant food containing sulfites. In Canada 10 sulfite-related adverse reactions have been documented, and 1 death suspected to be sulfite-related has occurred (Yang, W.H., 1985). The American Food and Drug Administration has banned the use of sulfites as preservatives in fresh fruits and vegetables, citing growing number of adverse reactions to the compounds. The ban applies to retail sales of fresh produce by food stores and restaurants. In addition, the FDA requires new labelling of processed foods that contain detectable levels of the compounds (Raymer, W.J., 1986).

Inadvertent Additives to Food Supplies

Environmental additives are chemicals which inadvertently contaminate our food. Such substances as chlordane (a pesticide residue in milk), and sulfonamide (a drug residue in pork) can contaminate the food supply and present health hazards (Pim, L.R., 1981).

Breast milk samples from 5 different regions across Canada showed the continued presence of PCBs and a number of other chlorinated hydrocarbon compounds. There were minimal regional differences in residue levels, which were also similar to those found in other industrial nations (Mes, J., 1986).

Canadian consumers may not be able to fully protect themselves from harmful chemical substances in their food supply, even though the chemicals may be banned in this country. Central America has become a lethal dumping yard for pesticides that North American and European chemical companies are banned from selling or producing. Many foods which are imported to Canada from Central America contain residues of chemicals which are proven to cause cancer and/or central nervous system damage, such as DDT, paraquat, Phosvel, DBCP and others (Todd, D., 1987).

Not all foods are benign, or remain benign during storage. Mycotoxins such as aflatoxins, fusarium toxins, and penicillium toxins can occur naturally in some foods or agricultural commodities due to fungal infection, and have been related to cases of both human and animal disease (Scott, P.M., 1983). Some foods contain natural carcinogens or anticarcinogens (Ames, B., 1983).

Potential Health Effects of Pesticide Exposures

In an Australian study, long term exposures to organophosphorus insecticides were associated with schizophrenic and depressive reactions, along with severe memory impairment and concentration difficulty. A field survey gave some support to the possibility that psychiatric disorders might be less frequent in towns than in fruitgrowing regions of Australia where insecticides were used (Gershon, S., 1961).

Pesticide exposures at various levels have been associated with cancers, deleterious reproductive outcomes, and subtle neurologic changes. The nervous system has been recognized as a target organ for pesticide toxicity for several decades (Shearer, R.W., 1983), (Sharp, D.S., 1986). The delayed health hazards of pesticide use have been difficult to detect.

Environmental chemical exposure was postulated as a possible cause of Behcet's disease, a mucocutaneous-ocular syndrome leading to blindness, ulcers, and sometimes death. Most of the patients studied had a history of contamination with organochlorine compounds and/or organophosphorus pesticides. The number of patients in Japan with this disease declined following the banning of certain strong toxic chemicals, including DDT, BHC (benzene hexachloride) and parathion, with some time lag. The researchers postulated that Behcet's disease may be caused by environmental chemicals, which may cause supersensitivity of the tissues, possibly leading to abnormality in the immune system (Ishikawa, S., 1986).

Water Contamination

Federal researchers have been reported to have written that there is strong evidence to link Great Lakes pollution with health problems such as cancer and birth defects. Cancer rates and rates of birth defects were found to increase from west to east along the lakes, and are heaviest near highly-contaminated sections such as the Niagara and St. Lawrence Rivers. People living along the lakes suffer higher rates of heart disease and strokes than other Canadians. Followup research is planned (Israelson, D., 1987).

Many unexpected compounds can show up in drinking water or other beverages. Cadmium, for example, can enter the water supply from water pipes (Schroeder, H.A., 1973), as can copper when acidified lake water is used (Franklin, C.A., 1985). Asbestos was at one time widely used for filters in the chemical, food and beverage industries, resulting in asbestos fibres in most beers, wines and liquors, soft drinks, sugar and lard (Kruss, P., 1979). Plastic food and beverage containers can also allow various compounds to pass into food and water (Kailin, E.W., 1963).

A meeting of the Working Group was convened by the WHO Regional Office for Europe in collaboration with the Austrian Government. Legionnaires' disease, a multisystem disease with pneumonia as the principal clinical feature, acquired its name following the mysterious outbreak among people attending an American legion convention in Philadelphia in July 1976. In January 1977, a previously unrecognized bacterium was shown to be the agent responsible for the Philadelphia outbreak. The bacterium was named Legionella pneumophila and is now known to be a member of a large family of Legionellaceae.

Dramatic common-source outbreaks of Legionnaire's disease have occurred in hotels, hospitals, and other establishments in association with contaminated water systems, in which the Legionella bacterium has incubated in warm standing water, for example, in shower heads (World Health Organization, 1982).

2.3.4 Physical Factors

There is an extensive literature on the effects of physical factors on people's health. These include many aspects of sound, light and other portions of the electromagnetic spectrum. It is not within the scope of the present study to review this literature completely, other than to sample it and bring it to the attention of the reader, who can follow up through bibliographies in the references that are cited. Where physical factors, or some particular aspect of them, have been recognized only recently as possible contributors to either ill health or good health, we have tried to include a more complete selection, to indicate the scope of any scientific debates still underway. Where information was available, we have included both negative effects of the physical factors, and some comment on benign or positive levels of the same factor.

Effects of Sound on Human Health

High sound levels can induce responses in the human body that are not specifically related to the auditory system. In most instances, a physiological change is evident only during, or for a short time following, the noise exposure. Noise can affect blood circulation, the resistance of the skin to electrical potentials, skeletal-muscle tension, hearing, breathing, and sleep. There is also evidence that noise can affect the gastrointestinal tract, change the size of the pupils of the eyes, and change the rate of saliva and gastric secretions (White, F.A., 1983).

Psychological and sociological response to noise is difficult to quantify. Many such reactions to noise seem to be related more to personality factors than to specific noise conditions. A person's psychological response will also be conditioned by whether he or she feels that the noise is a personal infringement of a basic right to acoustic privacy. Other influencing factors are whether the noise is essential, the relationship of the noise to personal activity, the noise's predictability or unpredictability, and frequency of occurrence (White, F.A., 1983).

In a U.S. study, a positive, but not statistically significant, association was found between aircraft noise exposure and the risk of high-frequency hearing loss (Green, K.B., 1982). A comparison made by others, between a sound-proofed and a non sound-proofed school, both exposed to aircraft noise, noted that children did not express any feeling of disturbances as to the frequency of airplane passage. However, after prolonged exposure to the auditory stimulus, perturbations of certain intellectual, psychomotor and personality aspects were observed. Noise-triggered attentional troubles were suggested as an explanation for most of the negative effects observed (Moch-Sibony, A., 1981). Another study indicated that the percent of elementary school students reading below grade level increased as the noise exposure level from aircraft increased (Green, K.B., 1982).

Effects of Exposure to Different Kinds of Light

Possible connections are being investigated between skin cancer incidence and occupational ultraviolet light exposure from fluorescent lights as well as from lamps used in printing and dyeline copying (Elwood, J.M., 1986).

Recent research indicates that there are a great many non-visual effects of light on people. Of these effects, the suntan effect and the control of rickets are two that are well understood. Other important but less well known effects include synchronization of a number of physiological rhythms, and prevention or control of infantile jaundice (Hathaway, W.E., 1983). Human muscle strength appears to be weakened under exposure to light that lacks part of the natural spectrum (McGee, C.T., 1979). A study comparing classroom behaviour in windowless rooms with standard type fluorescent cool-white tubes, with that in rooms with full spectrum, radiation-shielded fluorescent fixtures, showed increased hyperactive behaviour (Ott, J.R., 1976).

Windowless environments, especially in deep-core buildings, have a number of disadvantages that are reviewed in the literature (Health and Welfare, 1980). Teachers like the absence of windows in teaching spaces because they prevent the students from being distracted by outside happenings and extra wall space can be put to good instructional use. Others contend that the curious child in a well-conducted classroom already has an information overload. Some professional educators, however, have questioned whether the elimination of outside distractions is always something to be desired — an exterior happening may frequently provide a fruitful stimulus to educational activity (University of Michigan, 1965).

Effects of Exposure to Low-Frequency Electromagnetic Fields

A growing body of research indicates that electric and magnetic field exposures can have biological effects and may cause stress to human beings (Becker, R.O., 1982). However, there is not yet a clear concensus among researchers as to whether these effects constitute a long-term risk to human health, and, if so, the magnitude of that risk (Budd, R.A., 1985), (Ontario Ministry of Health, 1987).

Earlier studies of electrical power transmission and distribution workers, as well as railway high-voltage substation workers, did not yield any significant correlations of health with the subjects' measured or estimated exposure to electromagnetic fields (Broadbent, D.E., 1985), (Baroncelli, P., 1986). Later evidence has raised the possibility that an increased incidence of certain cancers, including leukemia, might be related to exposures to power frequency fields, including fields generated within homes (Edwards, D.D., 1987), (McDowall, M.E., 1986), (Savitz, D.A., 1987). This work has been reviewed by others and is not sufficiently conclusive or convincing to warrant the conclusion, at this time, that extra low frequency electromagnetic fields pose a significant health risk (Ontario Ministry of Health, 1987).

There is some evidence that the nervous system may be affected by ELF electric fields that are far too weak to have a direct effect on brain synaptic function or membrane excitability through field influence on ionic motion through the cell membrane. Animal studies have also shown effects on calcium exchange from various brain tissues. However, none of the evidence indicates that even strong electric fields have effects that compromise a person's ability to function, or have long-lasting or permanent effects on neuro-physiological health (Jammet, H., 1985).

There are preliminary reports from the United States (Rea, W.J., 1987) and from Great Britain (Smith, C.W., 1987) that a small segment of the population may exhibit a sensitivity to electric and magnetic fields, and may in fact be particularly sensitive to certain specific frequencies of field oscillation, including those in the power frequency range of 50-60 Hz. These individuals tend to exhibit immediate or chronic physical and/or psychological symptoms when in the presence of various electromagnetic fields. Massive pesticide exposures were suggested as the possible cause for some individuals being rendered both chemically sensitive and electromagnetically sensitive (Rea, W.J., 1987).

The possible effects of home and office electromagnetic exposures is now becoming of some concern to individuals seeking healthier lifestyles. Typical magnetic field exposures from hair dryers, motors, and other home appliances far exceed the magnetic field exposure even directly beneath high-voltage transmission lines (Epstein, S.S., 1974), (Becker, R.O., 1982). Video display terminals can expose operators to both electric and magnetic fields, and new designs have been suggested to incorporate more shielding (Marha, K., 1982), (Marha, K., 1983).

Although there are no Canadian standards for electromagnetic field exposure, Ontario Hydro notes that strict Soviet standards would still permit unlimited exposure by the public, of the fields under Ontario's 500 kilovolt lines (Ontario Hydro, 1983).

Exposure to Ionizing Radiation

There are a number of occupational and health care environments in which people in Canada may be exposed to ionizing radiation, which is known to have adverse health effects at certain exposure levels. Some radioactive materials emit high-frequency radiation which can penetrate the body even though the materials remain outside (gamma rays and X-rays). Some radiation is emitted in the form of beta particles, which are able to penetrate the outer skin layer and do some internal damage to humans. When radioactive particles are taken within the body through inhalation or ingestion, they can do more severe local biological damage to the cells immediately surrounding the bone, organ or tissue in which they lodge (Bertell, R., 1984).

Other Physical Factors

The percent utilization of total blood sulfhydryl group shows changes under stress from heat, cold, hypoxia, head-tilt, acceleration and vibration. Changes varied from a fall of 61% from normal to a rise of 43% (Iyer, E.M., 1985).

Studies have been undertaken of the effect on respiratory diseases of increasing indoor relative humidity. Kindergarten children, schoolchildren, soldiers and office workers were studied, and the results showed significantly lower absenteeism and/or occurrences of respiratory illnesses in the spaces with the higher humidities (Green, G.H., 1979).

Breathing an increased concentration of ambient negative air ions was shown in one study to improve incidental visual memory in children. The action of negative ions on the neurotransmitter, serotonin, is suggested as the possible mechanism by which negative ions could produce such effects (Kershner, J.R., 1984).

2.3.5 Social Conditions

It is becoming increasingly clear that many social conditions are stressful to people, and may have an adverse impact on health (Selye, H., 1976). The literature has many suggestions as to what may be detrimental, but not much solid proof to link the suggested causes with the effects claimed. Some medical research, however, is demonstrating very specific stress effects within the body, in particular, on immune function, which lends some credence to the more general claims.

To the extent that researchers have suggested positive social conditions that will promote health, we have included discussion of them. Participation of individuals in decisions that affect them stands out as one of the most concrete suggestions. Personal situations such as poverty and unemployment, which may arise out of more general social conditions, are touched on in this section, but will be dealt with more specifically in Section 2.3.6 "Employment and Money".

The Specific Health Effects of Social Stresses

Psychological and social stressors have been found to affect the immune response and disease susceptibility. Different individuals can respond quite differently to the same environmental stressor, and patterns of immediate and delayed responses to stressors may differ markedly (Ciaranello, R., 1983). Interactions between different classes of stressors can exert markedly more severe adverse effects than can a single stressor in itself (Bell, I.R., 1982). There are stressful levels of environmental stimulation which can represent an overload. Conversely, social isolation and restricted environmental stimulation can lead to stimulus underload, which can also be unhealthy (Suedfeld, P., 1983). It is possible that high-energy places, people and activities can strengthen one's immune system (Humiston, K., 1987). Although environmental factors may contribute to stress, the specific behaviour which results will relate to each individual's own way of perceiving his or her environment (Keating, J.P., 1983).

Increased psychological stress (as typified by examination stress in graduate students) will alter immune functioning and heighten psychological responses (Didriksen, N., 1986). Humoral immune functioning, as measured by immunoglobulin levels, shows an increase during periods of stress. Anxiety can be related to external events, and this can increase under stress. Anxiety is associated with lower emotional stability and coping skills, and is coincident with tension, an increased number of physical complaints, and obsessive-compulsive trends (Didriksen, N.A., 1987).

Of course, not all environmental factors are negative. Seeking positive influences in life, including good family and spiritual life, food, clothing, housing, reading, music, art, and socializing, can have healing effects (Humiston, K., 1987).

Social Conditions Which Adversely Affect Health

Both physical factors and social factors in our environment contribute to our pace of life. Physically threatening, noisy, or polluted environments can be stressful. Similarly, information overload or decision overload can be part of a stressful environment. Environments which are unsuited to the user also produce stress (crowded freeways, prohibition of play in buildings containing children). Some environments carry psychologically and socially meaningful messages that affect people within them (e.g. people experiencing increased status become healthier, people whose educational background exceeds their current status are less healthy than others in the same circumstances) (Saegert, S., 1975). Uprooting, dehumanization of people by institutions, side-effects of innovations, and politics which constrains environmental health programs, are also seen as stressful (Levi, L., 1983).

Environmental stressors interact with numerous psychological variables to produce adverse effects on health and well-being (Campbell, J., 1983). Psychological factors such as perceived control, information about the stressor, coping resources, and certain personality traits all may mediate the influence of physical environmental stressors on human well-being. Global, chronic phenomena such as air pollution, community noise, and crowding can be viewed as a distinct class of stressors, namely ambient stressors. Such stressors represent noxious stimulation and place demands upon us to cope. Ambient stressors over the long run are expected to affect several dimensions of human well-being, including motivation, emotions, attention, somatic health, and behaviour (Campbell, J., 1983).

Stressors in the family and job environments have been proposed to play a role in the modulation of pain. One study indicated that environmental stressors, including family conflict, family control, and general stress, were greater in the group with chronic low back pain than in the group without. The relationship turns out to be a complicated one which illustrates how difficult it is to make competent generalizations about the effects of stress. For example, increased family conflict was associated with increased psychological distress and increased incidence of pain, but increased family independence was correlated with less distress and increased pain. Less peer cohesion, less physical comfort, and less job clarity were correlated with increased pain, but not distress. Work pressure was associated with decreased depression and less pain, possibly decreasing pain by distraction (Feuerstein, M., 1985).

In the design and organization of many physical settings, the human properties of the individual are ignored or oversimplified. Spaces and places are often improperly designed in physical terms. Human needs for privacy, territoriality and freedom of choice are often overlooked as well. The danger is that we will adjust at the price of a continuing erosion of the properties that make us distinctively human (Proshansky, H.M., 1975).

Different socio-economic groups deal with assaults on the territory adjoining their homes in different ways. For instance, residents on a high-crime, low-income street have little material or political means to use as a leverage against possible threats. Co-resident distrust is likely, thereby precluding effective group social action against a threat. When people experience less control over this territory than is desired, the discrepancy is viewed as stressful (Taylor, R.B., 1985).

The pursuit of environmental security in an urban context becomes an unending process for urban dwellers. Physical settings increasingly make demands on people because of their frequently growing complexity and accelerated change. Having control, understanding, and competence in any setting are matters of critical importance to a person's self-identity and related feelings of self-esteem (Sarason, I.G., 1983). Fear of crime is greatest in communities that either lack the power to regulate themselves or perceive that they lack such power (Nietzel, M.T., 1986).

In cities, the nature and intensity of environmental stimulation, including its predictability and the extent to which it can be controlled, assumes considerable importance (Kaminoff, R.D., 1981). The quality of urban life is rooted in factors such as freedom from intergroup conflicts, full employment, maintaining democratic freedoms, and integrity in public life (Proshansky, H.M., 1986).

In local environments such as homes for the elderly, different modes of operation generate different stresses. In one case, problems arose when alert patients were housed together with confused patients, and antagonized each other. When confused patients were housed with frail patients, the former found their environment sad and depressing. This environment tended also to injure the confused resident's self-esteem, reduced functional competence, and increased the potential for aggression. As a result, the home was reorganized around four primary patient needs: independence, emotional support, safety and security, and physical care (O'Connor, D., 1987).

Poverty, lack of good housing, violence in the media, child abuse, parents who engage in antisocial behavior and alcohol abuse are cited as risk factors for children developing behavioural and psychological disturbances (Gelfand, D.M., 1986). Children are also aware of the arms race much earlier than adults suspect. This awareness and the perception that few adults are doing anything to prevent a nuclear war result in a profound distrust of adults and adult values (Goldberg, S., 1985).

Widespread abuse of illicit drugs and alcohol, the use of physical violence in domestic crises, and extensive use of cigarettes and caffeinated beverages such as coffee are all signs of a stressed population. Each of these practices in turn has health and injury consequences and poses a danger to public health (Meggs, W., 1987).

The uncertainties offered by both military and civilian uses of new, complex technologies may represent considerable stress, though this has not been well researched. Actual episodes of environmental contamination also represent sources of stress, through fear of passive exposure to toxic sources (Smith, L.F., 1987). Nuclear technology is one example; many people are concerned both by the potential for nuclear war, and by the use of nuclear power to produce electricity. Some are influenced by the psychological association between nuclear power and nuclear weapons, while others are concerned about the gaseous and liquid radioactive wastes discharged during normal operation, the potential dangers from the radioactive clouds that could escape in the event of a nuclear accident, the difficulty of disposing of radioactive waste, the toxicity of plutonium, or the possibility that plutonium might be diverted clandestinely into nuclear weapon production (Eisenbud, M., 1978).

Some researchers feel that dense urban neighborhoods may be related to low neighboring among residents. Crowded urbanites may withdraw from local contacts with neighbors as a specific adaptation to immediate high levels of stimulation (Baldassare, M., 1975), (Saegert, S. undated). Others feel that density, though perceived as unpleasant, does not appear to have definite and consistent detrimental effects (Fischer, C.S., 1975).

Participating in Design of Our Environments

Most of us believe we have no opportunity to design or shape our environment. Professionals often make design decisions in isolation, although the environment has an awesome impact on our lives (Abel, C.B., 1981). Involvement in planning one's own environment is vital to self-esteem and good mental health. The probability of achieving an environment that will prevent mental illness is increased when planning of the environment is conducted by those who must function within the environment (Insel, P.M., 1983b). People have an active need for control over their own environment. Having control reduces the stress generated by an aversive event by providing individuals with an guaranteed upper limit, or by enabling them to match their internal state with external events (Miller, S.M., 1980).

Citizen participation in environmental decisions is critically important, because this is the way in which people can become identified with a new environmental action — the way in which they can possess and feel responsible for it — thus reducing their alienation. Identity, recognition, and some sense of power are human needs. Because an environment becomes a social symbol when it is perceived as representative of someone or some social group, physical planning decisions can threaten the identity and status of certain groups, while enlarging the powers of others (Appleyard, D., 1979).

Health promotion and disease prevention involving participation by many different sectors, as well as the public, is seen as necessary by one researcher. Community development is offered as the proper approach to many health problems, including: appropriate technology in waste management, transportation, food production, energy use, and manufacturing process; quality food, shelter, work, safety and education with the emphasis on self-reliance rather than dependence; integrated caring neighbourhoods, built to human scale; support services for those with special needs through a strong social support network; a wellness system rather than an illness system; and involvement of the whole community (Layton, J., 1987).

Many of our common environments could be more accessible and more adaptive than they are. An adaptive environment is possible when a) the users are skilled enough to use basic design tools to make small changes as their individual and group needs change; b) the environment supports specific activities that occur in the space for all users regardless of age; size; mental, physical or emotional state; and c) users and designers together assess what works and what fails to meet users' requirements, with successes and failures documented for future reference in designing similar settings (Abel, C.B., 1981).

The Need for Change in Social Conditions

A number of researchers expressed frustration that in overall health strategies in Canada, individual self-care is stressed without recognition of the overall physical and structural problems in our society. This emphasis may deflect attention away from environment and socioeconomic causes of ill health. It also pushes people to assume impossible levels of individual responsibility without recognizing that they have decreasing control over the environment in which they live (McKillop Farlow, D., 1987). Little attention has been paid to deliberately designing stress-reducing environments (Saegert, S., 1975).

Honesty in communication is proposed by one researcher as an essential stress-reducing ingredient, using the example of potential environmental contamination, such as would be involved in PCB spills or nuclear accidents. A steady flow of information must be maintained, even if it means admitting the temporary absence of data (Smith, L.F., 1987).

Another researcher proposes a new 'paradigm', or set of assumptions, to guide public health policy: that an individual becomes ill when he or she cannot resist or avoid biological organisms and their by-products, pollutants, or safety hazards; that resistance is lowered by stress; that the type of health problems attributable to pollutants will depend on the community's economic base and natural setting; and that health problems attributable to safety hazards are predictable from a community's economic base. The paradigm would expect that as stress levels rise in a given community, those with genetic predispositions will become ill before those with average or above average tolerance. If public health is to contend with the illnesses precipitated by stress, pollutants, and safety hazards, it must become more familiar with the economic and social processes which shape the human community (Catalano, 198?).

Yet another researcher suggests various ways of changing work to make it less stressful: increasing a worker's control of work arrangements; providing mechanisms for worker participation in decision making on the organization of work; avoiding monotonous, machine-paced, and short but frequent work actions; optimizing automation; helping workers see their specific task in relation to the total product; avoiding qualitative work overload or underload; facilitating communication and support systems among work mates and others (Levi, L., 1983).

2.3.6 Employment and Money

The Price of Unemployment

What has never really been faced and adequately dealt with, about unemployment, is the physical and emotional toll it takes from those affected. This may be due as much to attitudes toward employment in Canada, as it is to the financial difficulties individuals and families face when income drops significantly. Full employment in the traditional sense may be an economic fantasy; but finding more creative ways of helping everyone feel valuable, cope financially, and keep his or her life goals on track, fully employed or not, may not be. We are going through an era of post-industrial development which may involve considerable dislocation and adjustment. Better attention to the human consequences could bring Canadians the message that their health and wellbeing is at the top of the national agenda, and not just secondary to economic goals.

Substantial health differences have been observed between employed and unemployed individuals. The unemployed show significantly higher levels of distress, show greater short-term and long-term disability, report a larger number of health problems, have been patients more often, and use proportionately more health services. Unemployed individuals appear to be more vulnerable to serious physical ailments such as heart trouble, pain in heart and chest, high blood pressure, spells of faint-dizziness, bone-joint problems and hypertension. While these health differences persist across socio-economic and demographic conditions, females and older unemployed individuals report more health problems and physician visits whereas people under forty report more psychological distress. The blue-collar unemployed are considerably more vulnerable to physical illness, whereas the unemployed with professional background report more psychological distress. The low-income unemployed who are also the principal family earners are the most psychologically distressed (D'Arcy, C., 1985).

Evidence linking unemployment to poor mental health does exist and is stronger than that linking it to poor physical health (Hertzman, C., 1986). Mental hospital admission rates vary according to economic changes (Kirsh, S., 1983). People who are unable to work undergo not only economic hardship, but also experience physical, psychological, and spiritual distress. Preventive mental health care will require assessment, anticipation, and response to, the social impacts of employment patterns (Canadian Mental Health Association, 1984).

When personal and financial resources are stretched to the breaking point, women as a group are affected particularly severely, as they continue to try to provide mothering, support and household comforts in an atmosphere of tension and strain. Feelings of guilt, anger and despair, turned inward or outward, are a powerful part of the chronic umemployment picture (Canadian Advisory Council on the Status of Women, 1987).

For the mentally disabled, finding employment presents a special set of problems including the stigma of mental illness, the effects of some medications, time gaps in resumes, lack of work incentives, and an entrenched sheltered-workshop mentality (Kirsh, S., 1983).

The Price of Poverty

A special study of Ontario's health care system concluded that children in families living on welfare get sick because of poor nutrition and hostile living environments (Spasoff, R., 1987). Children from families living on welfare are three times more likely than their schoolmates to end up repeating a grade or being sent to remedial classes for slow learners. Only 46 per cent of the children of the poor end up in advanced high school programs needed for university entrance, compared with 88 per cent of children of middle-income-earning families (Crawford, T., 1987).

Health researchers from the National Centers for Disease Control in the United States determined that many children under five years of age from low-income families are shorter or fatter than most other youngsters, possibly because of chronic under-nutrition (Toronto Star, 1987). Other sources also confirm that children living in poverty suffer adverse health consequences (Miller, C.A., 1985). One million Canadian children live in families with incomes below the poverty line (Crawford, T., 1987).

The prevalence of risk factors for cardiovascular disease tends to be higher among men and women with a low level of education, and hence among people with generally lower income. (The risk factors considered include cigarette smoking, obesity, elevated diastolic blood pressure, physical inactivity, excessive alcohol consumption, elevated serum cholesterol level, diabetes mellitus and the joint use of oral contraceptives and cigarettes.) Both men and women in lower socioeconomic groups are more likely than higher-income people to die from cardiovascular disease (Millar, W.J., 1986).

Research in the United States supports the hypothesis that properties of the sociophysical environment in federally-designated poverty areas may be important contributors to the association between low socioeconomic status and excess mortality, and that this contribution is independent of individual behaviours. Residents of a federally designated poverty area experienced higher age-, race-, and sex-adjusted mortality over the follow-up period compared with residents of nonpoverty areas. This increased risk of death persisted when there was multivariate adjustment for baseline health status, race, income, employment status, access to medical care, health insurance coverage, smoking, alcohol consumption, physical activity, body mass index, sleep patterns, social isolation, marital status, depression, and personal uncertainty (Haan, M., 1987).

Resolving the Dilemma

New 'work agendas' may be required, in which some of the ideas people in Canada presently hold about work can be updated to take into account economic realities (Novick, M., 1986), (O'Hara, B., 1987). Access to decent jobs remains a primary life aspiration for the vast majority of the adult population in Canada, yet full employment in the traditional sense may be virtually impossible to achieve, particularly with the present pace of dislocation and change arising from both local and world adjustments in trade and technology. The present distributions of work among Canadians are also very rigid, and may require change, for example, to even out the extremes of the overworked and unemployed (O'Hara, B., 1987).

Without some form of resolution which allows both sufficient income, and sufficient dignity and respect, for those who are employed less than full time, or at less challenging work than they would like, we can expect adverse health impacts and growing stress for many people. Some suggestions include specific changes such as special tax rates to cushion annual job hour reductions, shelter policies to stabilize housing costs, national income credits for parents, universal leave programs, enriched pension entitlements, and tuition rebates and interest free loans for students of all ages (Novick, M., 1986).

Social, economic and collective determinants of lifestyles have tended to be ignored in recent approaches to health promotion. A focus on changing personal habits and lifestyles has been more effective among the higher educated and higher income groups. There is a danger that isolating lifestyle and personal responsibility as major determinants of health, without attention to the structural changes needed, will lead to frustration on the part of those who see a broader change as necessary (Angus, D.E., 1986).

2.3.7 Personal and Social Support

Stressful life events are associated with the onset, incidence, and prevalence of a wide range of physical and psychiatric disorders. Social support networks have been studied as possible buffers or mediators of such stress (Dean, A., 1977), (Fischer, C.S., 1982). Considerable work is still required, however, to fully understand both the role of life events and the role of support. The connection between life events and health is influenced by many factors, including a person's social characteristics, his or her stage of life, personality traits and coping repertoires, as well as the supportiveness of social networks (Dohrenwend, B., 1983).

Is having friends enough? Not always, because the concept itself means different things to different people. One study found that this label is likely to be applied: to an overwhelming majority of non-relatives in a largely unsystematic way; to associates lacking other, specialized role-relations; to people of the same age; to people known a long time; and to people with whom respondents had primarily sociable, rather than intimate or material, involvements (Fischer, C.S., 1982).

People may vary in their need for, and ability to sustain, social relationships. Some evidence indicates that elderly people may have fewer social relationships than younger adults, but are more content with what they do have. Elderly women who were studied had more affectional ties than elderly men. The presence of offspring in the same town increased the number of close ties and of social relationships, but were more important for men than for women. Elderly people with cognitive impairment or dementia had less social interaction than they would like. Elderly people who were depressed reported having markedly less social interaction than the mentally healthy elderly, but did not complain that it was too little (Henderson, A.S., 1986).

Stress associated with organizational settings, such as work or school, constitutes a major part of the total stress experienced in people's lives. Organizational settings place demands on people to perform and to relate to a broad range of others in specified ways. At the same time, organizations present opportunities for much human contact and could be valuable as part of an effort to reduce stress or improve health (Kahn, R., 1983).

The physical and social environment does influence whether we are well-connected with others, or largely alienated. Many researchers have claimed that modern urban life can destroy community, and some evidence tends to support this. For example, people with below-average household incomes and living in semirural communities were found to have more local non-kin associates, bound up in denser networks, than did low-income respondents residing in other places. The semirural people tended also to report a slightly more positive sense of well-being than their counterparts elsewhere (Fischer, C., 1982).

It is clear that our social networks do influence our behaviour, and in turn, that behaviour can affect our health. For example, drinking and smoking by both male and female study subjects have been directly associated with that of male and female friends, with congruent gender relationships being strongest. Activity level for both genders was positively associated with exercise by male friends. Prevention programs may need to incorporate strategies to maximize peer support for healthful behavior, and to counteract the effects of unhealthful behavior modeled by peers (Gottlieb, N.H., 1986).

Our perspective on how to achieve individual health may have to widen to include community environment, if we are to be successful. One researcher emphasizes that the process of healing "involves not only the individual, but the community, tribe, and family as part of the larger social and physical environment" (Duhl, L.J., 1984). This may be another way of saying that because we are influenced by our larger environment, we cannot achieve individual health without taking action to improve the larger environment.

2.3.8 Health Care and Social Services

Incorporating Environmental Awareness into Health Care

A competent, efficient and accessible health care system is a necessary component of a healthy environment. Its approach to health promotion and to healing may set the upper and lower limits to health in Canada. The message from the literature, over and over, is that the approach to health care in North America does not adequately recognize the role of environmental factors in health. This is part of a larger issue of general adaptation to many changing needs, including those of an aging population, a post-industrial society, and changing human service needs (Vayda, E., 1986).

The revolution in understanding of the health effects of polluted indoor environments arose in non-medical professions. Architects, engineers, building managers, chemists, ventilating experts, educators, learning specialists, and many others, have gained and spread information about low-level chemical exposures and their effects on health. One of the difficulties many of them face is a shortage of knowledgable medical support for the environmental health problems they are now dealing with daily. Diagnosis and treatment of environmentally-related health problems are still concentrated in the hands of a small number of specialists in Canada, and have not been incorporated well into general practice. Multi-disciplinary programs are beginning to be developed to respond to indoor air quality problems (Marchant, R.,, 1985), (Gosnell, D., 1987).

As the health care system begins to assimilate new information about the effects of environment, we will see it applied more often by the general physician in diagnosing the role of physical factors in disease. A detailed knowledge of the effects of primary outdoor and indoor air pollutants, on both healthy and impaired people will be required (Guidotti, T.L., 1983). Scientists working on health complaints associated with energy-efficient, tightly-constructed, mechanically-ventilated office and residential buildings predict that physicians are likely to see increasing numbers of patients who work and live in 'sick' buildings (Riesenberg, D.E, 1986).

Considerable clinical experience has accumulated, primarily in other countries, with the effects of environmental contaminants on health. A spectrum of disorders affecting smooth muscles, mucous membranes, and collagen in the respiratory, gastrointestinal, genitourinary, and vascular systems have been described. The variety of symptoms presented are often mistaken for hypochondriasis, but actually can be triggered by foods and chemicals found in the patient's home and work environments (Rea, W.J., 1979a).

Ear, nose and throat involvement with environmental triggering factors appears to be the main early warning sign of environmentally triggered disease. Sensitivity to odours seems also to be common, many persons being intolerant of the odours of such substances as car exhaust, perfume, cigarette smoke, aerosol sprays, formaldehyde, alcohol, phenol, food, mould and dusts. Often rhinitis occurs. Recurrent sinusitis as well as severe otitis, various forms of vertigo (including Meniere's disease), and laryngeal edema are frequent presentations of the problem. Any portion of the respiratory system can be involved, resulting in such inflammatory diseases as recurrent bronchitis, bronchiectasis, and asthma (Rea, W.J., 1979b).

Since some human exposure to environmental contaminants appears inevitable, despite the best application of environmental laws and protection technologies, the health care system must also consider the need to develop adequate treatment methods (Selner, J.C., 1986) as well as the potential of reducing levels of contamination within the human body once they have accumulated (Schnare, D.W., 1984).

Hospitals as Healthy Environments

Just as the whole health care system requires greater focus on the effects of environment on health, a greater understanding of environmental effects within hospitals and other health care facilities is also important. For example, a well-designed physical environment can play a role in the prevention and reduction of psychological and social problems encountered by patients in acute care and psychiatric institutions. Factors that are important include spatial layout and design of hospital environments, privacy problems, personal control and independence, information interventions, hospital social relationships, and levels of environmental stimulation (Winkel, G.H., 1985).

For children, hospitalization is often a frightening and stressful experience. The child may feel insignificant, anonymous, overpowered, isolated, and intimidated by the scale and procedures of the hospital. The provision of familiar environmental cues through attempts to make certain areas of hospitals more home-like can help. For adolescents, greater opportunity to exercise choice and control in the physical environment will most likely result in less time spent resisting authority. Design also needs to take into consideration the need for family participation in the child's hospital stay (Ferguson, R., undated).

Greater Responsiveness to Hazards in the Workplace

While occupational disease is not a newly uncovered problem, its potential magnitude has only recently been widely recognized. The increasing awareness has led to pressure for regulating industrial health hazards and to efforts for cleaning up the workplace to minimize adverse effects of physical agents, biological hazards, chemical agents, ergonomic factors, and psychosocial stress. Many work-related diseases are not likely to be diagnosed because some physicians lack awareness of occupational hazards and neglect to take a comprehensive occupational history. Claims for many potentially work-related diseases are almost systematically rejected in the absence of strong supportive research (Yassi, A., 1982).

Measuring Behaviour and Performance as a Function of Environment

The role of hypersusceptibility to both chemical exposures and food in behaviour problems has also received greater attention in non-medical settings, such as school boards, than it has within the health care system (Small, B.M., 1985). Poor nutrition, toxic metal and other chemical exposures, and food allergies are among the adverse factors now considered as possible causes of brain malfunction in young people (O'Banion, D.R., 1981), (Rimland, B., 1981), (Davis, K., 1985). Maladaptive central nervous system reactions to chemical exposures or to otherwise nutritious food can occur in susceptible individuals (Philpott, W.H., 1981). Introduction of new knowledge in this area into clinical situations will require a broader repertoire of assessment and treatment techniques than is now commonly used (Strickland, B.R., 1982).

At the same time, behavioural toxicology is now firmly established as a legitimate component of the environmental health sciences. The adverse health impact of environmental chemicals can be gauged not only by death or overt damage, but by how people feel and function (Weiss, B., 1983). For example, exposure to carbon monoxide has caused performance deficits in experimental subjects (Laties, V.G., 1969). Behaviour and performance measures are increasingly being investigated as a first sign of impairment from low-level chemical exposures (Valciukas, J.A., 1980).

Greater Emphasis on Prevention Through Environmental and Dietary Control

Some criticism has been levelled at Canada's health care systems because they are often treatment-oriented rather than prevention-oriented. For example, some researchers maintain that lifestyle and environmental factors cause or promote at least 70% of cancer cases, and that many of these factors are controllable at the personal level (tobacco smoking, diet, occupational choices, alcohol consumption, viruses, excess sunshine, medicine and medical procedures, food additives, and environmental pollution). Motivating the public and the medical community to make changes in their lifestyles and professional practices is suggested as the next advance required to prevent cancer (Cullen, J., 1986).

The clinical spectrum of conditions in which environmental factors are of importance is being expanded. Studies are appearing which confirm that environmental control is of value in the management of many diseases (Finn, R., 1986). Similarly, there are some diseases that new research is finding responsive to dietary controls. For example, in a blind, placebo-controlled study of dietary manipulation therapy in outpatients with rheumatoid arthritis, there was significant objective improvement during periods of dietary therapy compared with periods of placebo treatment (Darlington, L.G., 1986).

New Research Into Environmental Hazards

As environmental health research expands, information on more new developments will require rapid dissemination to health professionals and assimilation into everyday investigations within the health care systems in Canada.

For example, the role of mould growth in Canadian residences is getting new attention. Potentially toxigenic fungi can be isolated from house dust. These produce mycotoxins, either volatile or absorbed onto particulates, which can have subtle effects on the immune system. These effects are often masked by the more obvious clinical and pathological findings of opportunistic infections, thus allowing the underlying cause to escape the attention of clinicians (Schiefer, H.B., 1985). Some researchers are suggesting that identification of all moulds in a household is in order, when the home contains individuals who complain of multiple symptoms for which no medical explanation can be found by other means (Day, J., 1986).

Very little information is available in the medical literature about the health effects of moulds and yeasts, compared to the clinical knowledge available. Sensitivities to moulds can cause a variety of symptoms such as headaches, ear and hearing problems, respiratory problems like bronchitis and asthma, gastrointestinal difficulties, weight gain and loss, food cravings, as well as dermatologic, muscular, urologic, and neuropsychiatric symptoms (Calabrese, D.V., 1986).

New mechanisms are needed to further clinical research on the identification and treatment of ill health that is triggered by, or aggravated by, environmental conditions. The rapid dissemination of knowledge about new diagnostic and therapeutic techniques is critically important in an era when environments change rapidly. For example, within a decade, the combination of new building materials and an emphasis on energy conservation led to a need for understanding the effects of exposures to complex mixtures of volatile organic contaminants, with each component at a relatively low concentration, over extended perods of time (for example, in residential exposures).

Long-Term Visions of Health Care in Canada

Many of the long-term visions for health care in Canada include an increased emphasis on health promotion and disease prevention. Strengthening the role of the individual and achieving a community focus for health have been suggested as two actions which will contribute to a system which leads to greater health promotion (Evans, J.R., 1987).

One researcher suggests a synthesis of environmental health, community-based public health, the primary health care concept, the holistic health movement and the self-care movement. It is compatible with and leads towards a sane, humane and ecological future (Hancock, T., 1980).

Greater focus on environmental health has been suggested, including: improving and organizing the data base on environmental health, especially in terms of linkages between morbidity/mortality data and environmental exposure; developing national environmental health policies aimed at prevention; developing more comprehensive and standardized risk assessment processes which take into account economic, social, and other factors; conducting research in the biological sciences with emphasis on individual sensitivities and the identification of defence mechanisms against toxic substances that contribute to ill health; and strengthening environmental health in medical training. Public agencies should be encouraged to inform the public about comparative risks and the risks of individual hazards (World Health Organization, 1983).

Health for all cannot be achieved by the health sector alone; it requires contributions from, and a new kind of co-operation with, many other sectors, including agriculture, animal husbandry, food, industry, education, housing, public works, and communications. At the same time, the health sector also needs to participate more actively in support of other sectors, for example, by participating more in surveillance and in the development of safeguards in the area of industrially-generated health hazards (World Health Organization, 1986). Massive changes will have to occur that involve public policies in many areas. Regional and social class inequities, as well as health problems due to substance abuse, industrial hazards, environmental pollution, unemployment and social isolation, must be addressed. The health care systems must allow and encourage physicians to practise health promotion (McWhinney, I.R., 1987).

Physicians are not the only care-givers that have a major influence on, or participate in, social issues which contribute to health. Nurses, for example, have always been a strong social force, and continue to be involved in economic, energy, environmental and social welfare problems. Other major issues affecting health are population growth, poverty, education, clean water supply, and family planning. Individual nurses and nurses' associations can exercise their influence and power in promoting health at local, national, and international levels (Labelle, H., 1986). The fate of humane, family-centered health care may rest on the ability of different caregivers to respond well to complex needs of families in crisis. The health social worker can play a major role in negotiating between families and health care professionals during illness (Dillon, C., 1985).

In a new vision of our health care systems, medical education would be up-to-date and would realistically reflect the actual health needs of the Canadian people. We all will have advanced beyond the concept that health is merely the absence of disease and that the physician's goal is to recognize and treat disease. Preventive medicine and health promotion will play an important part in the curricula. Clinical programs will allow more time in settings where students can acquire a more realistic view of the nature and extent of the major health problems that afflict people in Canada. In this vision, physicians carry some community responsibility for spreading information about healthy lifestyles (Squires, B.P., 1987).

Whatever vision takes hold, it is clear that the health care systems of the future must welcome the active participation of many more people, so that the full diversity of needs in Canada is taken into account, and so that the system stays more in touch with the realities of the day.

3. Bringing About Healthier Environments

This final analysis section focuses specifically on broad principles and ideas that emerge from the literature review, upon which strategies for change can be based. Five important components have surfaced during the review:

- ending prejudice and oppression
- creating a new vision of environmental choice
- fostering technology for assessing our environment
- accommodating diversity through participation in design
- becoming world experts in designing healthy environments

Each section following will explain briefly how these ideas are connected with achieving healthy environments for everyone in Canada.

3.1 Ending Prejudice and Oppression in Canada

Throughout the discussions in previous sections, we have pointed out the coincidence of unhealthy environments with conditions of prejudice. It is becoming clear that people who are held in high value in our society do not appear to get stuck in environments recognized as unhealthy, as often as those whom we value less.

While major strides have been made in human rights legislation, personal attitudes, and day-to-day behaviour in Canada, both overt and subtle forms of discrimination still persist. We are now understanding and acknowledging that even seemingly minor forms of devaluation of one group of people by another can lead to unhealthy conditions for the former. The effects include decreased self-esteem, decreased physical and mental health, higher risk of health impairment, and decreased resources and independence, which in turn limit an individual's control over health and environment.

The irony is that our tendency to rank and devalue others (which may have, at one time, had some rationale) is self-defeating in the mixed society of Canada today. In fact, about one in four Canadians feel they have been discriminated against in one way or another (Toronto Star, 1987). It is unlikely that anyone in Canada can go through life today without becoming, at least temporarily, part of a group whose characteristics have been devalued in some way. For example, everyone starts out young, and ends up old; most go through periods of economic upheaval and many experience times of unemployment and poverty; and many people go through periods of physical disability and illness.

The kind of attitude that ensures that everyone can create a healthy environment goes beyond mere tolerance of differences between people. Simply transforming an inferiorized group from outcasts to a minority, making acceptance conditional upon assimilating and hiding differences, or providing token power without full equality, will not accomplish healthy environments for everyone (Adam, B.D., 1978).

What we must aim for is the idea that everyone in Canada is a person of value, no matter what age, gender, race, religion, ethnic origin, culture, physical shape, mental ability, sexual orientation, employment, financial level, lifestyle, or any other characteristic that has been used to categorize people. When we can see value in someone, we are more likely to be outraged if he or she is in any way subjected to an unhealthy environment. When everyone is considered valuable, no one is ignored.

Prejudice feeds on ignorance; in order to keep your prejudice intact you must be sheltered from too much information about the people who are the targets of your prejudice (Clark, D., 1987). To curtail the politicial processes that protect people who are in the minority, you need only make them invisible (Mohr, R.D., 1985). What is different about the present era is that larger numbers of people who are experiencing oppressive behaviour by others (e.g. women, elderly people, ill people, handicapped people, gay people) are beginning to organize and become more visible, and they are insisting on the rights that are now more accessible to them because of legislation.

The key to ending a cycle in which people get forced into, or stuck in, unhealthy environments because they happen to be young, or old, or women, or physically disabled, or gay, or anything else, is to spread detailed, accurate information about them to others (Clark, D., 1987). In all cases we discover for ourselves they are really human beings with much in common.

In the past, it was considered sufficient to enact human rights legislation and to hope that discriminatory behaviour would slowly decrease as new generations grew up. Governments at all levels assumed the role of protectors of minority rights, when resources allowed and when there was sufficient political support.

If 'Health for All' is to be achieved, a more active stance against prejudice will be required by every individual and every organization in the country. We must base this stance on the assumption that everyone, given detailed enough information and strong enough incentive, is capable of changing personal attitudes that are not in anyone's best interests. There is no reason why the Canadian population itself could not now begin to assume a more active role in protecting the rights of others, particularly if such behaviour is more likely to lead to a healthier environment for themselves.

3.2 Creating a New Vision of Environmental Choice

Many references in the literature offer new visions involving greater environmental control and choice for individuals (Duhl, L.J., 1969), (Hooker, C.A., 1982), (Repace, J.L., 1983), (Schrecker, T.F., 1984), (Bradley, J., 1987), (Rea, W., 1987), (World Commission on Environment and Development, 1987).

Some emphasize an individual's right to know what he or she is being exposed to (Johnston, A., 1983), (Twigge-Molecey, C., 1987), and the idea of educated consumer choice leading to less-polluting materials (Andersen, I., 1982). Others offer specific designs for alternative, healthier environments (NcNall, P.E., 1975), (Sandia National Labs, 1982), (Small, B.M., 1985).

A common message in much of the literature is that being in control of our lives contributes to good health (Miller, S.M., 1980), (Insel, P.M., 1983b). Another message is that Canada is a nation of diversity, and that new approaches will be required to accommodate this diversity in a way that allows everyone a healthy environment (see also Section 2.3.4 "Accommodating Diversity Through Participation").

The vision required to implement 'Health for All', and in particular, healthy environments for all, is one in which, individually and collectively, we regain control over our external environments. This means empowering individuals and entrenching their rights to environmental control in many settings where they are now lacking (e.g. school health and safety, tenant health and safety), and improving their degree of control in other situations (e.g. industrial and commercial settings). On a wider scale, it means regaining control, as a society, over the introduction of new materials and new technologies into our lives, with the power to accept or reject based on solid information about their effects, both positive and negative.

The bottom line in a vision of environmental choice is information. Everyone in Canada has the right to better access to detailed information about his or her environments and the potential effects of those environments on health. Citizens in every setting are in a better position to take control and responsibility for ensuring that their own environments and those of others they affect are healthy ones, when they are knowledgeable about the 'ecology of health'. When citizens are better empowered environmentally, they tend to create for themselves the environments that suit their particular needs.

The answer to the question "what is a healthy environment for Canadians?" is that we need a great deal of flexibility and choice in our environments, because our needs and wants are diverse. Our common environments require more clever design, to accommodate a greater range of needs, a wider range of vulnerability to hazards, and a richer mix of human characteristics than we have acknowledged before. Our specialized environments need to be responsive to the specific characteristics of those who need them most, but must not ignore the full humanity of those whom they serve.

3.3 Fostering Technology for Assessing our Environment

We are fortunate that our era of rapid technological change, which has contributed to some of our environmental hazards, has also supplied us with new and better means to solve environmental health problems. There are a number of new technologies, all maturing over the last ten years, that together revolutionalize the field of physical environmental health. They provide quantifiable information about the connection between environmental contamination and health, that was never available previously. They are beginning to resolve the decades-long debate as to whether low-level pollution can affect physical and mental health, behaviour and performance. In fact, they remove any doubt that we are affected by our surroundings.

The first breakthrough was the refinement of technology for measuring contaminants in air and water down to ultra-trace levels, confirming what kind of environment we are exposed to (Dravnieks, A., 1971), (Berglund, B., 1982), (Hijazi, N., 1983), (Meyer, B., 1983), (Nagda, N.L., 1983), (Wadden, R.A., 1983). Manufacturers are developing many new forms of this technology in response to growing demand. There is still an overwhelming need to extend this technology by devising economical, standardized, calibrated instruments that can be used by people with relatively little training, to measure the full array of contaminants associated with the sick building syndrome (Akimenko, V.V., 1986).

The second breakthrough was the improvement of technology for measuring contaminants in body tissues and fluids, using sensitive and selective techniques of high-resolution gas chromatography and high-resolution gas chromatography-mass spectrometry, confirming that we do indeed absorb contaminants from our surroundings (Laseter, J.L., 1983), (Root, D.E., 1986). The method has been used to test for the presence of different arrays or families of chemical contaminants, including volatile hydrocarbon solvents, and chlorinated hydrocarbon pesticides and their common metabolites. In a screening series involving patients who exhibited chemical hypersensitivity, 99% had pesticide residues at or above the .05 ppb level in their sera (Laseter, J.L., 1983). The 'footprint', or array, of contaminants can be compared to similar measurements of the individual's environments, to determine possible sources of the absorbed contaminants.

The third breakthrough was the enhancement of brainwave measurement technology, with the use of high-powered computers, to the point that we can measure subtle brainwave changes of individuals in response to different environments (Bokina, A.I., 1976), (Haider, M., 1976), (Thatcher, R.W., 1985), (Kaye, H., 1987). This computerized diagnostic system provides physicians with a window into the brain, providing a high resolution colour image of the brain's electrical activity as well as complete quantification and statistical analysis of all electrical measurements. This form of testing can be used to evaluate persons who have been exposed to environmental chemicals. Preliminary testing has provided support for the contention that there are specific changes in brain function, that accompany cognitive or affective shifts, in patients who are sensitive to exposure to common foods and odours (Kaye, H., 1987).

The above triad of methods can be used together, to confirm the effects of specific chemical exposures on specific individuals: we can find out what a person is exposed to; we can obtain proof of exposure in the form of absorption; and we can determine how he or she responds to the exposures.

A fourth technology was invented a great many years ago, but is nevertheless proving to be a potent diagnostic and therapeutic tool in cases of illness suspected to be related to environmental exposures. It involves simply placing a person who is suspected of being adversely affected by his or her environment, into an alternative cleaner and healthier environment, to observe whether any differences in response can be measured (Rea, W.J., 1978), (Rea, W.J., 1984). In one study using this approach, patients with non-arteriosclerotic cardiac arrhythmias and/or chest pain refractory to medication, having various associated symptoms relating to smooth muscle sensitization, were studied in a rigidly controlled, relatively fume-free and particle-free environment. The majority of signs and symptoms were cleared in most of the patients, without medication, while under environmental control. Arrhythmias were reproduced in most of the patients, with controlled, repeated, individual blind and double-blind, incitant challenges (Rea, W.J., 1978). Expertise for creating suitable alternative environments is being developed in Canada (Small, B.M., 1983).

A fifth technology involves using an array of objective neurobehavioural and performance measurements to ascertain individual human reactions, other than brain electrophysiology, in response to environmental stressors including chemical pollutants. A large number of chemicals are known to have direct toxic effects on the central nervous system (Pryor, G.T., 1983), (Anger, W.K., 1984). Testing of people being exposed to a mixture of common indoor air pollutants indicated that mental performance can be impaired by indoor air pollution, and that the effects of low concentrations of organic gases and vapours can be measured objectively (Bach, B., 1985).

Finally, analytical methods in immunology hold a great deal of promise for further clarifying the effect of different environments on human beings. For example, certain chemical compounds such as polycyclic aromatic hydrocarbons (PAHs) have been shown to cause immune suppression in mice within two days after exposure. Animal studies have shown profoundly suppressed antibody response after exposures which produced no mortality or other obvious clinical symptoms of general toxicity (Dean, J.H., 1983).

Such new and powerful techniques bring us into an era in which it is finally possible to determine specific acute and chronic effects of the environment on individuals. Previously, major issues of chemical contamination and other environmental insults were examined primarily in terms of epidemiological comparisons, using surveillance of possibly-related, but not conclusively-related symptoms (Elinson, L., 1984), (Spitzer, W.O., 1984).

It is time, therefore, to stop arguing over whether environment is an important factor in health. Our new task is to further develop and apply these and other similar technologies, to quantify environmental effects and test alternative environments, until we find, and verify, healthier ways of living.

3.4 Accommodating Diversity Through Participation in Design

Many of our surroundings were designed without taking into account the full diversity of the population that would use them. One of the reasons that many people find themselves in unhealthy situations is that they belong to the group of people who were not considered when the situation was created. Many public and private environments were designed and built to standards which do not take into account even modest differences in people's age, physical capabilities, lifestyles, tolerance for pollution, and many other characteristics (Rand, G., 1985), (Bradley, E., 1986), (Bradley, E., 1987).

In fact, people do vary widely in their response to environmental stressors (Cooper, W. Clark, 1973), (Calabrese, D.V., 1986), and even different organ systems in one individual may have markedly different responses to the same stressor (Voronova, B.Z., 1980). The mix of characteristics within the population (demographics) also changes with time, for example, as the number of older people increases (Last, J.M., 1987). All these variations are important for long range health planning.

Diversity tends to be ignored through homogenization and invisibility. Lumping people with one common characteristic together may simplify design of physical or social environments, but it ignores their remaining characteristics, which may vary widely (Bradley, E., 1987). Ignoring the existence of people who are in the minority, or hoping that the number of exceptions to the norm is small, helps to keep diversity invisible. Prejudicing against individuals on the basis of one or more of their characteristics also virtually guarantees that those characteristics will be suppressed or hidden as much as possible, to the detriment of the individual.

A number of researchers have suggested, instead, that the full variability of response of people to environmental factors can be used to advantage, in establishing better health and safety standards, and in detecting in advance those environmental conditions which will prove, over time, to have adverse consequences for many people (Calabrese, E.J., 1978), (Plumlee, L., 1979), (Ostapovich, I.K., 1975).

One consistent theme in the literature is the need for participation in design of both physical and social environments, by people who will be using them (Wolfe, M., 1976), (Johnston, A., 1983), (Innes de Neufville, J., 1985), (Church, K., 1986), (Lecuyer, G., 1987), (Twigge-Molecy, C., 1987).

The antidote to ignoring diversity, similar to the antidote to prejudice, is more and better information. Direct involvement of people who are affected by any development, whether it be physical or social, will shatter the stereotypes used in design and guarantee that all human characteristics that must be taken into account are highly visible. To achieve this, we discard the assumption that professionals who design the various pieces of our society know the people they design for well enough to proceed without further discussion or information. We must further assume that people want to become, and are fully qualified to become, active partners in the design of environments that will affect them.

3.5 Becoming World Experts in Designing Healthy Environments

Recent reviews emphasized that economy and environment must be integrated, since long term economic growth depends on a healthy environment, and in turn affects our environments in many ways (Lecuyer, G., 1987), (Mustard, F.J., 1987), (World Commission on Environment and Development, 1987). Other reviews indicate that there is a growing international awareness of the need for new approaches to health (World Health Organization, 1986), (Hancock, T., 1987).

If Canada is to achieve 'Health for All' and healthy environments for all, it must be prepared for physical, social, and institutional changes that take into account the actual connection between the physical and social environments and health. These changes will involve new types of social design which take into account everyone's full value, including previously devalued or merely tolerated minorities. They will require more flexible physical designs and safer, less-polluting products and materials, which accommodate the full range of diversity of people, and the latest information on the effects of environments on health.

A nation cannot accomplish such a feat without learning a great deal. What we want in terms of healthy environments, the rest of the world also wants — we are all fully human and our similarities outnumber our differences. Every healthy physical design, every healthy social structure, every non-polluting product or material, every well-thought-out device that is built not to harm its users, every method for involving users in design, every treatment for the adverse effects of unhealthy environments, every piece of information about achieving healthier environments, will be in demand worldwide.

In an age of intense industrial competition, in an era when advanced technologies enable many countries to produce sophisticated and valuable goods, each country seeks a niche, a way of distinguishing its products and services from those of others. Canada has always been associated with clean, peaceful living and competent technical design. Learning the 'technology' of healthy environments will add one more reason for other countries to look toward Canada for products and services to fill their needs. The incentive for Canadian manufacturers to create healthier products, for example, might be government assistance in finding export markets, under a 'Canadian Means Healthy' campaign.

The bottom line is therefore one of opportunity. Achieving healthy environments is, in the long run, not a cost but an investment, both in our domestic resources (everyone in Canada) and in our potential for exporting goods, services and knowledge to the rest of the world. If the job must be done, Canadians can do it well and become leaders in the field.

PART III
DETAILED BIBLIOGRAPHY AND ABSTRACTS

This appendix lists and reviews the references that are cited in PART II: ANALYSIS, as well as additional references that were consulted during the study and which had a bearing on the analysis and overview.

Most of the references are available by inter-library loan through the services of local public and university libraries. The Canada Institute for Scientific and Technical Information (CISTI), Ottawa, Canada, the National Technical Information Service (NTIS), Washington, D.C., USA and the National Library of Medicine (NLM), Bethesda, Maryland, USA will have copies of most sources.

In most instances, further bibliographic information, including ISBN numbers, special report numbers, and addresses of author or publisher organizations, is available from the computer data bank of the Foundation for Independent Research on Technology and Health, c/o Sunnyhill Research Centre, R.R.#1, Goodwood, Ontario L0C 1A0, Tel: (416)-294-3531.

References have been listed alphabetically by the first author. All authors are indexed in the "Name Index" section, and all keywords as well as other principal words and phrases in the abstract have been indexed in the "Subject Index" section of this report.

Abel, Cora Beth (1981). What Is An Adaptive Environment?. Adaptive Environments, Massachusetts College of Art, Boston MA; 1981.

> Most of us believe we have no opportunity to design or shape our environment. Professionals often make design decisions in isolation, although the environment has an awesome impact on our lives. When people work in an environment where outside noise affects their ability to concentrate, they usually react by cutting back their sensitivity to the environment rather than boldly acting to change it, muffling the noise. An adaptive environment is defined as a positive relationship between the physical setting and the people who use that setting. It is possible when a) the users are skilled enough to use basic design tools to make small changes as their individual and group needs change; b) the environment supports specific activities that occur in the space for all users regardless of age; size; mental, physical or emotional state; and c) users and designers together assess what works and what fails to meet users' requirements, with successes and failures documented for future reference in designing similar settings. An adaptive environment is accessible and barrier-free to a much greater degree than normal. It is also free from the effects of attitudinal barriers that lead to insensitive and elitist design and supports all people's daily activities on the physical, psychological, and emotional levels. It allows all users to participate to the fullest extent possible in activities that occur within the space.

Adam, Barry D. (1978). The Survival of Domination: Inferiorization and Everyday Life. Elsevier North-Holland, Inc., New York, 1978.

> Dominated peoples develop a range of behaviour patterns to cope with their recalcitrant social environment. The author describes the reactions to oppression in everyday life, of individuals who are subordinated, by concentrating on three groups: Jews, blacks and gay people. He notes that how people survive domination through resistance, accommodation and compliance tells us much about how domination survives and how inequitable social order is reproduced. He comments on the difference between liberal tolerance and true acceptance, the former merely transforming an inferiorized group from criminals to minorities or deviants. Assimilation promises a 'deal', wherein the identity, culture, and values of the inferiorized are to be negated, or at least concealed, in return for the promise or opportunity of improved life chances.

Adam, Barry D. (1987). The Rise of a Gay and Lesbian Movement. Twayne Publishers, Boston, MA, 1987.

> The author reviews human rights issues for lesbian and gay people, including child custody, tax and family laws, municipal zoning regulations, social welfare, health care, insurance and employment. The present AIDS crisis has also highlighted the issue of 'spousal rights' and distribution of property upon death. He points out that prejudices against homosexuality have led to obstacles being presented against distribution of literature about 'safer sex', a term used to describe sexual practices which minimize the risk of transmission of sexually transmitted diseases such as AIDS. He comments on the 'immense cost' to individuals of the psychological suffocation and fear, suffered by those in hiding.

Adelman, Richard C. (1979). Loss of Adaptive Mechanisms During Aging: from the Symposium, Overview of the Biology of Aging. Federation Proceedings, Vol. 38, No. 6; May 1979; Federation of American Societies for Experimental Biology.

> One general feature of all aging populations is the progressively modified ability to adapt to changes in the surrounding environment. In this study, factors contributing to modifications in the capability for enzyme adaptation as an expression of aging are reviewed. Specific examples of altered enzyme adaptation include the responses of hepatic glucokinase activity to glucose and of hepatic tyrosine aminotransferase activity to starvation in rats. These reflect disturbances in hormonal regulatory mechanisms.

Adkinson, N. Franklin Jr. (1977). Environmental Influences on the Immune System and Allergic Reactions. Environmental Health Perspectives, Vol. 20, pp. 97-103; 1977.

> Environmental interactions with the immune system may result in two types of adverse outcomes: immunodeficiency and immunopathology. Serious immunodeficiency most commonly results from ionizing radiation or as a recognized side effect of iatrogenic drug therapy, usually cancer chemotherapy. Environmentally-triggered immunopathology is a source of considerable morbidity and mortality. Additional research is needed, particularly in the area of identification of risk factors which predispose to immunopathological outcomes when individuals are exposed to sensitizing chemicals or other natural allergens.

Adkinson, N. Franklin (1977). Environmental Influences on the Immune System and Allergic Reactions. Environmental Health Perspectives, Vol. 20, pp 97-103; 1977.

> Environmental interactions with the immune system may result in two types of adverse outcomes: immunodeficiency and immunopathology. Serious immunodeficiency most commonly results from ionizing radiation or as a recognized side effect of iatrogenic drug therapy, usually cancer chemotherapy. At present there is little basis for believing that biologically significant suppression of immune competence results from more subtle interactions with environmental agents. On the other hand, environmentally-triggered immunopathology is a source of considerable morbidity and mortality. Additional research is needed.

Akimenko, V.V.; Andersen, L; Lebowitz, M.D.; Lindvall, T. (1986). The 'Sick Building' Syndrome. Evaluations and Conclusions for Health Sciences and Technology; Indoor Air, Volume 6; pp 87 - 97; Swedish Council for Building Research; 1986.

> There have been some advances in our knowledge of sick buildings during the last few years. The syndrome can only be diagnosed by building user complaints and specific causes of complainant symptoms have usually not been identified. Guidelines for future research needs are presented. These include an overwhelming need to devise better, standardized, calibrated instruments to measure health effects associated with the sick building syndrome. There is also a need for technical studies of the relative importance of the various chemical sources of pollutants in different types of buildings in order for preventive measures to be introduced. There is a need for simple and inexpensive methods for the study of ventilation rates and efficiency. Threshold limit values developed to protect workers in the industrial setting should not be used in the non-industrial setting.

Allen, Max; Armstrong, Russell; McPhee, James (1987). Censorship Bulletin #6. Canadian Committee Against Customs Censorship; June 1987.

> The Canadian Committee Against Customs Censorship was formed to fight seizures of lesbian and gay books by Canada Customs. The committee makes the argument in this publication that customs guidelines are being used to discriminate against gay-related reading materials, and that to do so will deny many people accurate information on homosexuality, lesbianism, and sexuality in general. They suggest that the provision of detailed information on 'safer' sex for all individuals, and especially for young people, is a necessary component in the fight against Acquired Immune Deficiency Syndrome (AIDS).

Alphey, R.S.; Leach, S.J. (1974). Accidental Death in the Home: Building Research Establishment Current Paper. Building Research Station, Dept. of the Environment, Great Britain; 1974.

> 6,500 accidental deaths in homes in England and Wales were studied for the period 1950 to 1972. The deaths in 11 categories, ranging from the largest which was falls, to categories with small numbers, such as excessive cold or electrocution, are plotted and trends examined. Marked seasonal fluctuations of up to 100 percent between winter and summer occur, suggesting that dwellings are not adequately performing their function of isolating the occupants from the effects of climate. The risk to an individual from accidental death in the home is between a third and a half of that from death in a road traffic accident for those under 65.

Altman, Irwin; Werner, Carol M. (1985). Home Environments: from Human Behavior and Environment; Advances in Theory and Research; Volume 8. Plenum Press, New York; 1985.

> This is an intensive treatment of the home environment. Some chapters span many cultures, others focus on homes in industrialized nations or developing nations, some deal with the indoor environment exclusively, while others focus on the neighborhood and country in relation to homes. Also analyzed are the broad societal forces such as housing services and political pressures.

Ames, Bruce N. (1983). Dietary Carcinogens and Anticarcinogens: Oxygen Radicals and Degenerative Diseases. Science, Vol. 221, No. 4617, Sept. 23 1983; American Assoc. for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington DC 20005.

Ammann, Harriet M. (1987). Effects of Indoor Air Pollution on Sensitive Populations. Clinical Ecology, Volume V, No. 1, pp. 15-21; 1987.

> This paper, prepared by a physiologist and health scientist at the U.S. Environmental Protection Agency, reviews health hazards and physiological effects of indoor air pollution on populations at higher than average risk, including infants and the elderly, pregnant women and their fetuses, anemic and asthmatic persons, those with compromised cardiovascular or pulmonary function, and siblings of sudden infant death syndrome victims. In the aggregate, these persons make up a considerable portion of the public. Considering time exposure, their risk may be considerably greater than that calculated using workplace exposure factors.
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> Mimicry of common illnesses, including influenza, food poisoning, gastrointestinal disorders, Alzheimer's disease, angina or brain deterioration, results in misdiagnosis of intoxication from indoor air pollution and the underestimation of its occurrence.

Andersen, Ib; Lundqvist, G.R.; Molhave, L. (1975). Indoor Air Pollution Due to Chipboard Used as a Construction Material. Atmospheric Environment, Vol. 9, No. 12, pp. 1121-1127; 1975; Pergamon Press.

> Chipboard (particle board) is a common building construction material made of wood shavings held together with a urea-formaldehyde glue. Due to this composition, there is a continuous emanation of formaldehyde. Measurements in 25 rooms in 23 Danish dwellings where chipboard was used in walls, floors and ceilings showed that the average concentration was 0.62 and the range 0.08 - 2.24 mg formaldehyde m 3 air, exceeding the German threshold limit for occupational exposure. In all rooms, the concentration exceeded the German limit for continuous exposure for outdoor air. The adverse health effects of low levels of formaldehyde are irritation of the upper airways and conjunctivitis. The need for air quality standards and control programs for indoor air in the home is stressed.

Andersen, Ib; Lundqvist, Gunnar R.; Proctor, Donald F.; Swift, David L. (1979). Human Response to Controlled Levels of Inert Dust. American Review of Respiratory Disease, Vol. 119, pp. 619-627; 1979.

> The authors studied nasal mucous flow, airway resistance, and subjective response in 16 young healthy subjects during 5 hour exposures to 2, 10, and 25 mg of inert dust per m-3 in an environmental chamber. The dust was fully polymerized plastic dust containing carbon black. The number of these particles in room air, expressed as a per cent of the total number of particles was 36, 41, 14, 7, and 2, respectively, for the aerodynamic size ranges less than or equal to 1.8, 1.9 to 5.3 to 8.9, 9.0 to 12.4, and greater than or equal to 12.5 um. No significant changes in nasal mucociliary clearance rate or nasal resistance were observed.

At all dust concentrations there was a decrease in 1-sec forced expiratory volume, but not in the forced vital capacity or the forced expiratory flow during the middle half of the forced vital capacity. The nasal penetration fraction of particles was approximately 55 percent for the smallest particles and 20 percent for the largest. Discomfort was proportional to the concentration of dust, but lagged almost 2 hours behind the changes in dust concentration. The discomfort was never excessive; the main complaints were dryness in the nose and pharynx.

Andersen, Ib (1979). Formaldehyde in the Indoor Environment—Health Implications and the Setting of Standards: Indoor Climate - Effects on Human Comfort, Performance, and Health in Residential, Commercial, and Light-Industry Buildings; Fanger, P.O., Valbjorn, O.—editors. Danish Building Research Institute, Copenhagen; 1979.

Exposure to formaldehyde vapour causes irritation especially of the eyes and upper airways. Skin irritation may also occur. The background concentration in outdoor air is about 0.05 mg/m 3. Indoor concentrations up to 1-2 mg/m 3 have been found in rooms with emanations from construction materials made of resins. The literature on the biological effects of formaldehyde is reviewed and the results of an exposure of 16 young healthy subjects to 0.3, 0.5, 1.0 or 2.0 mg formaldehyde/m 3 air during 5 hours are described. There was no change in airway resistance. Eye irritation and dryness in the nose and throat was experienced by 3 subjects at 0.3 and by 15 at 1.0 mg/m 3. A standard for continuous exposure protecting all but subjects sensitized to formaldehyde against any adverse health effect and the majority of the subjects against discomfort is suggested at or lower than 0.15 mg formaldehyde/m 3 air.

Andersen, I; Seedorff, L.; Skov, A. (1982). A Strategy for Reduction of Toxic Indoor Emissions. Environmental International, Vol. 8, pp 11-16, 1982; Pergamon Press Ltd.

Many building materials emit pollutants. To reduce the exposure of the population to the major groups of toxic indoor pollutants, a strategy is put forward which concentrates on a reduction of the emission of carcinogenic substances, eye-airway irritants, and odors from building materials. It is the experience of the Danish National Inventory of Toxic Substances and Products that preventive measures in the form of either a complete removal of a substance or replacement of a toxic substance by a less toxic substance are possible. Among the banned or regulated substances in Denmark are asbestos; epoxy and polyurethane products; and another 1771 building materials including sealants, glues and adhesives, paints and lacquers, and wall/floor coverings. Based on an analysis of publicly available information on the labels of these products, the authors conclude that a notification system makes it possible to select the products with the least impact on human health and comfort, and, consequently, with the lowest need for ventilation. It is suggested that these toxicological principles should be used for the improvement of existing and future building materials.

Anderson, Darrell E. (1971). Problems Created for Ice Arenas by Engine Exhaust. American Industrial Hygiene Association Journal, No. 32, pp. 790-801; December 1971.

> Episodes of illness in separate arenas from carbon monoxide and nitrogen dioxide exposures are described. Typical symptoms have been headache and nausea among children and headache among adults. In one episode, symptoms of illness were sore throat and tightness in the chest. Some of the unrecognized effects of low-level carbon monoxide exposure such as disturbance of coordination, judgment, psychomotor tasks, and visual acuity, and marked increases in choice discrimination errors and reaction time, which have been pointed out by recent medical research, are of added concern. Excessive air concentrations of these gases resulted from the operation of ice resurfacing machines. Carbon monoxide concentrations up to 250 ppm following one episode and nitrogen dioxide concentrations up to 40 ppm following the other were found. All 45 ice arenas in Minnesota were visited subsequently to evaluate the variables responsible. Engine exhaust and ambient air data are presented. Infrared analyzer recordings of carbon monoxide concentrations in three arenas are shown. Possible methods of controlling exhaust gas problems are discussed.

Anderson, Joan M. (1986). Ethnicity and Illness Experience: Ideological Structures and the Health Care Delivery System. Soc. Sci. Med., Vol. 22, No. 11, pp 1277 - 1283; Pergamon Journals Ltd.; 1986.

> This paper analyzes the experiences of Anglo-Canadian and immigrant Chinese families with a chronically ill child by using the idea that the social organization and ideology of health care services generate particular illness experiences. Immigrant families find that the ideology is not compatible with their customs for managing illness. This often leads to non-compliance and ineffective treatment. Health professionals explain non-compliance by the obvious facts of cultural differences, but the author argues that it should be understood by institutional practices that exclude families from participating in caretaking. Patients and families should be included in decisions that affect their lives. Pressures from government to economize by increasing home care services, and the increasing number of immigrants may force practitioners to negotiate culturally acceptable care with them.

Anger, W. Kent (1984). Neurobehavioral Testing of Chemicals: Impact on Recommended Standards. Neurobehavioral Toxicology and Teratology, Vol. 6, pp. 147-153; 1984.

> Historically, the American Conference of Governmental Industrial Hygienists has served as a major source of information on recommended safe exposure limits (Threshold Limit Values or TLVs) for chemicals most frequently encountered in industry and of known toxicologic significance.

A review of the ACHIH Documentation Book, which details the basis for their judgements, has indicated that 167 of the 588 chemicals for which they assigned recommended standards have, as one of their bases, direct nervous system effects.

Angus, Douglas E.; Manga, Pran (1986). National Health Strategies: Time for a New "New Perspective": special article. Canadian Journal of Public Health; Vol. 77, pp 81 - 85; March/April, 1986.

A decade has passed since "A New Perspective on the Health of Canadians" was published by Liberal Health Minister Lalonde. But current information suggests that many of our health problems have stayed much the same. In addition to looking at overall life expectancy as an indicator of health status, one should consider the more comprehensive healthfulness of life. Looking at health from this perspective could lead to big changes in the relative priority accorded to each cause, with all the implications for health planning and policy making that would entail. There need to be firmly articulated goals and objectives, principles and rules governing the design of programs in pursuit of these goals, and a clear notion of resources that should be allocated for implementation. Also as part of a rational planning process, health needs must be assessed, priorities must be established, progress monitored and programs evaluated. Information is important, as is good communication between users and producers of health data.

The term lifestyles has been used as a synonym for personal behaviour. Social, economic and collective determinants of lifestyles tend to be ignored. This partial and restricted conceptualization of the problems is at odds with the broader message in the New Perspective. There is a danger that isolating lifestyle and personal responsibility will lead to frustration on the part of those who want a broader change, and may fail to gain the acceptance of the target groups, if not the general public.

Universal health insurance has succeeded in bringing about a high degree of equity in access to services, but did little to increase consumer responsibility and awareness for personal health care. There is no doubt that people in the bottom income groups have lower health status than those at higher income levels despite equitable access to services. This paradox may become more significant over time, since lifestyle modification has been more effective among the higher educated and income groups.

Appleyard, Donald (1976). Transportation as a Social Environment: Can We Change a Tradition?. Transportation Planning for a Better Environment, Vol. 1, section 5; Stringer, Peter and Wenzel, H., ed.; New York: Plenum Press; 1976.

A revolution is taking place in transportation planning due to public disenchantment with traditional planning methods and the closed nature of the old transport planning process. This demands a restructuring of basic concepts and values. Transportation must be seen as a service rather than a facility and should be user- and neighbour-oriented. Systems must be seen as complementary rather than competitive. The planning must be multi-functional and multi-disciplinary and needs to be more open to public participation than the present closed professional system of planning. Environmental and social professionals, environmental planners, landscape planners, urban designers, sociologists, community organizers, political scientists, psychologists, and ecologists should be hired as full-time staff members in transportation agencies. Every discipline suffers from isolated specialization, a phenomenon that is destructive to the quality of urban life.

Appleyard, Donald (1979). The Environment as a Social Symbol: Within a Theory of Environmental Action and Perception. APA Journal, pp 143 - 153; April 1979.

Professionals and social scientists tend to screen out the connections between the physical environment and its social meaning. In this paper, a communications model of environmental action and perception is developed and elaborated. An environment becomes a social symbol when it is intended or perceived as a representative of someone or some social group. This can be seen when upper middle-class whites move into an area formerly inhabited by lower-class blacks and "improve" it, planting trees, and renovating buildings, to the distaste of the old residents. The attributes of environmental actions in different contexts, and the differing modes of perceiving and interpreting environments, especially during environmental conflicts and in home environments, when social meaning is dominant, are explored. The implications for public policy include a) physical planners and designers should be much more aware of the fact that the need for identity, recognition, and even some sense of power is a human need which has a necessary outlet for expression in the physical environment; b) physical planning decisions can threaten the identity and status of certain groups while enlarging the powers of others; and c) the significance of citizen participation in environmental decisions is critically important, because this is the way in which people can become identified with a new environmental action, the way in which they can possess and feel responsible for it, thus reducing their alienation. An extensive bibliography is included.

Arlien-Soborg, P.; Zilstorff, K.; Grandjean, B.; Milling Pedersen, L. (1981). Vestibular Dysfunction in Occupational Chronic Solvent Intoxication. Clinical Otolaryngology, Vol. 6, No. 4, pp. 285-290; 1981; Blackwell Scientific Publications.

Neurotoxic volatile organic solvents used by house and car painters may lead to professional toxic encephalopathy after several years of exposure. The symptoms are memory impairment, fatigue, personality changes, headache and dizziness. Vestibular dysfunction was found in

55 percent of 113 painters examined, mainly in the form of reduced caloric vestibular reactions. No correlation between vestibular dysfunction and the duration of exposure, cerebral atrophy or intellectual impairment could be demonstrated. Vestibular examination may be helpful in detecting early changes in exposed persons and in determining more accurate safety limits for harmful chemicals.

Aronow, Wilbert S. (1978). Effect of Passive Smoking on Angina Pectoris. New England Journal of Medicine, Vol. 299, No. 1, pp. 21-24; July 1978.

The effect of passive smoking on exercise-induced angina in a well ventilated and in an unventilated room was evaluated in 10 patients with angina. Patients exposed to 15 cigarettes smoked within two hours in either room increased their resting heart rate, systolic and diastolic blood pressure, and venous carboxyhemoglobin and decreased their heart rate and systolic blood pressure at angina. Patients exposed to passive smoking in an unventilated room had a larger increase in resting heart rate, systolic and diastolic blood pressure, and venous carboxyhemoglobin and a greater reduction in heart rate and systolic blood pressure at angina.

Asher, Janet K. (1977). Toward a Safer Design For Stairs. Job Safety & Health, Vol. 5, No. 9, pp. 27-32; 1977; U.S. Dept. of Labor, Occupational Safety and Health Administration, Washington DC.

Stairway accidents are largely caused by design shortcomings. A study of 11,000 stairway accident reports and videotapes of 30,000 people using stairs which utilized stop-motion analysis indicated that victims typically slip while descending stairs. Seven guidelines for constructing, retrofitting and use of stairs are presented. These include minimizing the use of public stairways; removal of distractions, conspicuous treads and handrails; extended handrails; elimination of deceptive floor coverings and shadows; proportion that fits the users; tight tread coverings; internally stable and slip-resistant surfaces for good traction.

Axelson, Olav; Hane, Monica; Hogstedt, Christer (1976). A Case-referent Study on Neuro-psychiatric Disorders Among Workers Exposed to Solvents. Scand. j. work environ. & health 2, pp. 14-20; 1976.

Published reports give justification for the belief that long-term exposure to solvents might induce chronic but nonspecific neuropsychiatric conditions. This case-referent study of data from a regional Swedish pension fund register indicated a risk ratio of 1.8 in regard to nonspecific neuropsychiatric disorders among workers such as painters, varnishers and carpetlayers who are exposed to solvents as compared to workers not so exposed. Moreover a dose-response relationship seems to exist between exposure in terms of occupational years and neuropsychiatric conditions.

Axelson, Olav; Gustavson, Jan (1978). Some Hygienic and Clinical Observations on Styrene Exposure. Scand. j. work environ. & health 4, suppl. 2, pp. 215-219; 1978.

> Styrene exposure levels in the range of 100 to 300 ppm have been measured in small shops manufacturing glass fibre reinforced plastic products such as boats, steeping baths, etc. Exposure control through determinations of mandelic acid in the urine at the end of the workday have been suitable and convenient. Over the years during the 1970s, there seem to have been amendments in the exposure situation in Sweden if judged on this basis. More or less severe central nervous disturbances have been observed among the workers.

Axelson, Olav; Edling, Christer; Kling, Hans (1979). Lung Cancer and Residency—A Case-referent Study on the Possible Impact of Exposure to Radon and its Daughters in Dwellings. Scand. j. work environ & health 5, pp. 10-15; 1979.

> In view of the well-known urban-rural difference in lung cancer rates, remaining also after standardization for smoking, it is suggested that low levels of radon and its daughters in dwellings might be of etiologic importance to this disease. To test this hypothesis, a study was undertaken in a rural area; it considered residency in wooden, mixed type, and stone houses among cases of lung cancer and a control group. The results indicate an increased risk of lung cancer among residents in mixed type and stone dwellings. Additional studies are highly desirable to confirm or refute these findings, which, if valid, mean increasing lung hazards caused by a decrease in ventilation in future energy saving unless special measures are undertaken to reduce radon daughters in dwellings.

Bach, Bodil; Molhave, Lars; Pedersen, Ole F. (1985). Human Reactions During Controlled Exposures to Low Concentrations of Organic Gases and Vapours Known as Normal Indoor Air Pollutants: Performance Tests. Proceedings, 3rd International Conference on Indoor Air Quality and Climate, held in Stockholm, Sweden, August 20-24, 1984. Volume 3: Sensory and Hyperreactivity Reactions to Sick Buildings, pp. 397-402.

> Human subjects suffering from indoor climate symptoms were exposed to various concentrations of a mixture of 22 common indoor air pollutants. Among several objective and subjective measurements, performance tests and investigations of irritation to the trigeminal nerve endings were undertaken. The digit span test, testing memory impairment, showed significantly decreased scores during exposure to organic gases and vapours, whereas the graphic continuous performance test, testing the ability to attend and concentrate, showed no effect of exposure. No significant effects on the trigeminal nerve endings were found. The authors conclude that indoor air pollution seems to impair mental performance, and that the effects of low concentrations of organic gases and vapours can be measured objectively.

Bakacs,T. (1972). Urbanization and Human Health. Akademiai Kiado, Budapest; 1972.

> The growth of cities has had an impact on human environment and ecology. There are many factors of urbanization which induce damages to health, including air and water pollution, unsolved issues of sanitation, urban noise, increased risk of exposure to carcinogenic substances, and the stressors of city life. In comparison with the mass destruction caused by epidemics, these micro-hazards seem to be of minor importance, still they become very important if their chronic, cumulative effect is considered. These damaging aspects of the urban environment are discussed in detail in an international context, accompanied by statistics. Suggested general solutions are proposed. Extensive references are included.

Baldassare, Mark (1975). The Effects of Density on Social Behavior and Attitudes. American Behavioral Scientist, Vol. 18, No. 6, pp 815 - 825; July/ August, 1975.

> The results of a 1965/66 study in Detroit were analyzed using two personality scales termed "powerlessness" and "need for affiliation". It appears that dense urban neighborhoods may be related to low neighboring among residents. Crowded urbanites may withdraw from local contacts with neighbors as a specific adaptation to immediate high levels of stimulation. More detailed data on social relations are needed.

Baldassare, Mark; Fischer, Claude (1975). Suburban Life: Powerlessness and Need for Affiliation. Urban Affairs Quarterly, Vol. 10, No. 3, pp 314 - 326; March, 1975.

> Studies were undertaken to examine the differences in behaviour among urban and suburban residents. No substantial evidence was found to back up any hypotheses that suburbanites differ ecologically, demographically, or behaviourally from city dwellers. It was concluded that explanations for suburban life style should be sought elsewhere.

Ball, Ian (1987). Personal Interview, Ian Ball, Ottawa, Ontario. Personal interview, September 5, 1987.

> The author was approximately twelve years of age at the time of the interview. He stated that adults did not often take people of his age seriously; that adults commonly treated people of his age 'like kids' and not as people in their own right; and that adults have power over him to force him to do things, like cleaning his room.

Ball, Roger; Smith, Roy (undated). Design Criteria for the Control of Health Hazards in Schools. Alberta Workers' Health, Safety and Compensation, Occupational Hygiene Branch, Edmonton Canada.

> This manual sets basic design criteria for ensuring a healthy working environment and is to be used in the planning of new school facilities as well as the upgrading of old ones. It concentrates on those areas in schools where potentially hazardous conditions are most often encountered. It covers: ventilation, noise, illumination, volatile substance storage, woodworking shops, automotive shops, fine arts, music rooms, science laboratories, changing rooms, general classrooms, and various occupational training areas.

Balser, Diane (1987). Women: Their Present Situation in the World: Detailed Proposals for Policies and Actions; The Final Summary Report of an International Women's Conference, The Netherlands, October 12-17, 1984. Sisters, No. 8, pp. 59-80; 1987; Rational Island Publishers, PO Box 2081, Main Office Station, Seattle, Washington 98111, USA.

> The author describes the clear challenges to the women's liberation movement as the complete elimination of sexism, and women becoming the decisive force in determining the future of mankind. The Conference concluded that wherever possible, it should be asserted that the cause of sexism is not individual people, but the institutionalization of oppressive relationships in society, and that men, while conditioned to accept sexist patterns (of behaviour), are inherently good and are also oppressed in the present society.
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> Sexist oppression of women takes many forms, but the underlying basis is economic exploitation. Throughout the world, most women are poor. With the economic crisis, women more and more are pushed into the ranks of the poor. Full equality between men and women includes equal pay, equal opportunity, equal valuing of the work of both sexes, equal access to all levels of employment, equal distribution of all forms of work (e.g. men and women sharing labour such as parenting and housework, which was traditionally female).
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> The delegates noted that the majority of women learn to live every day with the fear of physical and emotional violence, in the form of physical beatings by fathers, brothers, and lovers, as victims of rape and other forms of sexual abuse, and as victims of emotional abuse. They state that it is time to change the conditions in our society which perpetuate violence. Eliminating nuclear arms was also cited as an urgent issue facing women and all people.

Bardana, Emil J., Jr. (1980). Formaldehyde - Hypersensitivity and Irritant Reactions at Work and in the Home. Immunology & Allergy Practice, Vol. 11, No. 3, pp. 60-71; May/June 1980.

> Formaldehyde is a widely distributed low molecular weight compound which is highly soluble in water and capable of binding and altering human protein. The bulk of this material is used in the production of resin compounds employed as industrial laminates, binders and adhesives. Major exposures occur as a result of off-gassing from a variety of wood products and foam insulation. Potential for disease has been well documented in the skin where it can induce dermatitis by irritation, delayed-type hyper-sensitivity and immediate urticarial reactions. Its capacity to irritate the eyes and upper respiratory tract are well established. Observations to date also incriminate formaldehyde in the induction of an inflammatory bronchitis as well as bronchial asthma.

Bardana, Emil J., Jr.; Montanaro, Anthony (1987). The Formaldehyde Fiasco: A Review of the Scientific Data. Immunology and Allergy Practice, Vol. IX, No. 1, pp 11 - 23; January, 1987.

> Formaldehyde is a chemical with significant medical and industrial applications. Its potential adverse health effects triggered considerable public debate, fueled by the observation of nasal cancer in rodents with high cumulative formaldehyde exposures. In 1979, an attempt was made to analyze the literature on formaldehyde. It was felt that it had the capacity to act as both a respiratory irritant and immunogen. Since that time, there has been a literal explosion of data. This report summarized the new material as it relates to the practicing allergist.

Barker, Robert H. (1975). Additives in Fibers and Fabrics. Environmental Health Perspectives, Vol. 11, pp. 41-45; June 1975.

> The additives and contaminants which occur in textile fibers vary widely. Synthetic fibers such as nylon and polyester contain trace amounts of contaminants such as catalysts and deactivators which remain after the synthesis of basic polymers. In addition, there are frequently a number of materials which are added to perform specific functions such as traces of metals or metal salts and antistatic agents and flame retardants. After the fibers are converted into fabric form, other substances are applied to act as lubricants, sizing agents, antistats, bleaches, wetting agents, dyes, and durable press treatments.

Barnes, J.M. (1975). Assessing Hazards From Prolonged and Repeated Exposure to Low Doses of Toxic Substances. British Medical Bulletin, Vol.31, No. 3, pp. 196-200; 1975.

> A low dose is defined as one which by itself is less by one or two orders of magnitude than that dose of the substance that would produce an

unequivocal toxic effect. The levels of activity of bodily systems are determined by so many factors, including chemical substances, essential or non-essential to good health. Some of these may be present at different levels, because of variations in intake and disposal by different members of the population. The acquisition of more information on biological changes in response to low doses of toxic substances must be accompanied by the application of an increasingly better judgement of their significance.

Baroncelli, P.; Battisti, S.; Checcucci, A.; Comba, P.; Grandolfo, M.; Serio, A.; Vecchia, P.; (1986). A Health Examination of Railway High-Voltage Substation Workers Exposed to ELF Electromagnetic Fields. American Journal of Industrial Medicine, Volume 10, No. 1, 1986; pp. 45-55; Alan R. Liss, Inc.

The study surveyed health conditions of railway workers active in 258 interconnection and conversion substations all over Italy. Measurements in 220 KV substations showed maximum levels of electric field strength and magnetic flux density of 5 kiloVolts/metre and 15 micro-Tesla respectively; No differences in health measures were found between exposed and control groups, taking account organ systems assumed to be at higher risk. The researchers conclude that workers exposed to extremely low-frequency electromagnetic fields of moderate strength do not show the presence of clear effects on their state of health. They note that an electric field strength of 5 kV/m is not considered dangerous, even in the most restrictive occupational regulations.

Bates, David V.; Sizto, Ronnie (1983). Relationship Between Air Pollutant Levels and Hospital Admissions in Southern Ontario. Canadian Journal of Public Health, Vol. 74, pp. 117-122; March/April 1983.

Published hourly data of measurements of particulate pollution from 15 air sampling stations in southern Ontario and computerized hospital admission for the 79 acute care hospitals in the region were examined. The months of January, February, July and August in 1974, 76, 77, and 78 were studied to find possible relationships between the two sets of data. For July and August, highly significant associations were found between excess respiratory admissions and SO2 and ozone and temperature, with 24 and 48 hour lags between the variables.

Batts Young, Bambi (1981). Chemicals That Cloud the Mind. Environment and Behavior, Vol. 1, No.3, pp. 1-3; August 1981; Center for Science in the Public Interest, 1755 S St., NW, Washington DC 20009.

It is not unusual for industrial workers to experience deterioration in behavior or in mental function after exposure to common industrial chemicals and pesticides. In one instance, researchers investigating the effects of "safe" levels of mercury found that a reliable prediction of certain memory problems could be based on a simple measurement of mercury exposure.

Bauman, Kay A.; Hale, F. A. (1985). Bringing the Homosexual Patient Out: Teaching the Doctor's Role. Medical Education, Vol. 19, pp. 459-462; 1985.

> The authors note that little attention is given in medical school curricula to providing appropriate care for the 5-10% of the population that is homosexual. A comparison was made between individuals taking an elective course involving discussions with articulate homosexual people around societal biases towards homosexuality and issues of health care delivery, and a control group. The study group became more accepting towards homosexual lifestyles significantly in 12 out of 15 measures.

Beaconsfield, P.; Krebs, H.; Borlaug, N.; Rainsbury, Rebecca (1975). Man-made Chemicals and our Milieu Interieur: A Preliminary Report from the Special Commission on Internal Pollution. Experientia, Vol. 31, No. 7, pp. 869-872; July 15 1975.

Beall, James R.; Ulsamer, A.G. (1981). Toxicity of Volatile Organic Compounds Present Indoors. Bulletin of the N.Y. Academy of Medicine; Vol. 57, No. 10, pp. 978-996; December 1981.

> Energy conservation measures reduce movement of air through the home and increase the atmospheric concentration of more than 40 toxic chemicals. In many instances, the effect of chronic exposure to small amounts of these chemicals is unknown. For instance, formaldehyde is a toxic chemical that illustrates the problem. Used in resins that are part of many home products, it causes adverse health effects when it offgasses into a tightly-sealed building. Most noticeably, it irritates eyes, skin and respiratory tract and causes allergic reactions. It also causes mutagenic and carcinogenic changes in test animals. Research is underway better to understand these chronic changes and to evaluate other potential effects. Physicians aware of indoor air pollutants can provide their patients with better medical care.

Becker, Henk A.; Porter, Alan L. (1986). Methods and Experiences in Impact Assessment. D. Reidel Publishing Company, Dordrecht The Netherlands; 1986.

> Keywords: impact assessment; environments;

Becker, Robert O.; Marino, Andrew A. (1982). Electromagnetism and Life. State University of New York Press, Albany, New York, 1982.

> The authors stress that the environment is now thoroughly polluted by man-made sources of electromagnetic radiation, with frequencies and magnitudes never before present. They conclude that the present abnormal electromagnetic environment can constitute a health risk. The authors provide background information which establishes that organisms can

receive information about their environment in the form of natural electromagetic signals, and that this can lead to physiological and behavioural changes. They review the effects of man-made electromagnetic energy upon the human nervous, endocrine, cardiovascular, and hematological systems. They conclude that electromagnetic energy can produce varied and nontrivial biological effects, that such effects can be produced at energy levels well below the limit which initiates thermal effects in tissues, and that the electromagnetic field is a stressor. Studies are cited which confirm that both high- and low-frequency electromagnetic fields have been show capable of impairing resistance to infection.

The authors conclude that while no biological function appears to be impervious to nonthermal electromagnetic fields, the nature, extent and physiological significance of the effects to be expected in different organisms remain, for the most part, to be determined by future studies. An extensive bibliography is included.

Befekadu, Ferede (1984). The Effect of Environmental Strain Upon Students' Comfort and Work Performance: Buildings, Ventilation and Thermal Climate; Berglund, Birgitta; Lindvall, Thomas; Sundell, Jan — editors. Indoor Air, Vol. 5, pp. 349-353; Swedish Council for Building Research, Stockholm Sweden, 1984.

Extensive investigations have been made in the past in order to provide a healthy and comfortable living and working indoor environment. This paper discusses the effect of thermal, visual and noise environments upon the health, comfort and work performance of students engaged in sedentary activity in the classroom. The investigation was carried out in two different buildings of different orientations and surroundings which offered varied environmental conditions. Suitable subjective criterias and corresponding scales expressing different subjective responses in terms of numerical values were used. Physical measurements on thermal, visual and noise environments were taken and simultaneous subjective assessment of 40 acclimatised subjects was made. Assessment results indicate a marked relationship between the physical measurements and the corresponding subjective assessment and also revealed that there were no marked interactions between the personal life of the subjects and the thermal, visual and noise environments.

Bell, Iris R. (1982). Stress, Immune System, and Illness. Presented at the 16th Advanced Seminar in Clinical Ecology & 17th Annual Meeting, Banff Canada, October 3-8 1982.

This paper discusses the human ecology concept of total load in relation to the scientific literature on stress. Psychosocial stressors, though difficult to assess, may cause significant biological changes. Interactions between different classes of stressors can exert markedly more severe adverse effects than can a single stressor in itself. The nature of the stressor and the chronicity of exposures can affect the specificity and extent of the biological response to the stressor. The physiological mechanisms by which stress could affect health include not only immunological, but also hormonal and neurochemical systems. The clinical implications of this work for allergists include the need for attention to the psychosocial consequences of abrupt disruption and/or loss of customary lifestyle by avoidance measures and to the need for adequate treatment of pre-existing psychosocial stressors in newly-diagnosed patients.

Bell, Iris R. (1982). Clinical Ecology: A New Medical Approach to Environmental Illness. Common Knowledge Press, Box 316, Bolinas CA 94924; 1982.

> Practitioners of clinical ecology maintain that a broad range of common physical and psychological disorders can be triggered in susceptible individuals by chronic and often low-level exposures to foods, environmental chemicals, and natural inhalants, with emphasis on the first two. Low doses of substances which singly might be benign may interact additively or synergistically on some common pathways in the body to produce illness, with the onset of illness depending on the total stress load, including all of the psychosocial, physical, chemical, antigenic or infective stressors that impinge on the individual.

Bellanti, Joseph A. (1974). Immunologic Responses to Chemical Pollutants. Pediatrics, Vol. 53, No. 5, Part 11, pp. 818-819; May 1974.

> The immune system may be considered a series of adaptive mechanisms to an ever-changing and hostile environment. Any teratogenic effect early in embryonic life can have profound consequences on the immune system of the developing infant. A number of chemical pollutants are known to injure the immune response of the fully developed organism. The human fetus and newborn are especially susceptible to substances like lead, cadmium, nitrogen dioxide, and sulfur dioxide.

Benard, J.M.; McKenna, T.A.; McKinnon, D.L.; Faraht, J.P. (1985). Relating Health and Environmental Studies in a Tight Building Syndrome Investigation. Air Pollution Control Association, 1985.

> A two-phased study was undertaken to investigate health and environmental complaints in a large, modern, hermetically sealed office complex. Health surveys of present and past employees were conducted to fully characterize the nature and magnitude of complaints. An environmental study was conducted to identify environmental factors but it was seriously limited by lack of time and money. Two ventilation parameters, fresh air supply and air distribution, were studied for ten floors which had been characterized as having low and high frequencies of the irritation syndrome. Ventilation was seen to be better with a uniform

office configuration on a floor. There was little indication that the type of symptom and type of environmental complaint were correlated in any meaningful way. Lessons were learned from this study and its limitations which can be applied to future studies of this type.

Berglund, B.; Berglund, U.; Lindvall, T.; Nicander-Bredberg, H. (1982). Olfactory and Chemical Characterization of Indoor Air; Towards a Psychophysical Model for Air Quality: from Indoor Air Pollution; Spengler, John—editor. Environ. Int., Vol. 8, No. 1/6, pp. 327-332; 1982; Pergamon Press, Oxford, Toronto.

The relationship between the odour strength of total air samples and the odour strengths of the constituents was investigated in three field experiments in an office building and a new preschool. Perception of odour is an important aspect of indoor air quality because a majority of these contaminants are odorous. Characteristic chemical patterns of indoor air can be detected and described with methods of pattern recognition such as component analysis. Such patterns may be different for different buildings; similarly, perceived odour patterns may distinguish indoor air samples from outdoor or other sources. The overall odour strength of an indoor air sample can be predicted from the number of components most frequently reported to have a strong odour.

Berglund, B.; Johansson, L; Lindvall, T. (1982). A Longitudinal Study of Air Contaminants in a Newly Built Preschool: from Indoor Air Pollution; Spengler, John—editor; pp. 111-115. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

In about 100 newly built preschools in Stockholm, staff and children have reported medical symptoms that are associated with bad air quality, such as dry throat, irritation of eyes and lips, hoarseness, hacking cough and itching. The air quality in one such preschool was investigated in a longitudinal study. Typical air contaminants emanating from building materials were determined, their variation over time (0-18 months) was measured, and the influence of the ventilation system on contaminant concentrations was studied. The study shows that all the organic compounds decline in concentration mainly within the first 6 months of occupancy. A preschool building needs to be gassed off during the first six months after its construction with no recirculation of return air allowed. During at least 1 to 2 additional years, it is desired that the recirculation rate of return air is restricted, perhaps to 50%.

Berk, James V.; Hollowell, Craig D.; Pepper, James H.; Young, Rodger A. (1980). The Impact of Reduced Ventilation on Indoor Air Quality in Residential Buildings. University of California; Lawrence Berkeley Laboratory, Energy and Environment Division, Berkeley CA; March 1980.

The levels of air contaminants inside buildings are often higher than ambient outdoor levels. Interest in conserving energy has been motivating home-owners and builders to reduce infiltration rates in residential buildings and builders to reduce ventilation rates in institutional amd commercial buildings. However, the resulting decrease of indoor/outdoor air exchange will tend to increase the concentration of many indoor air pollutants. Three indoor contaminants—nitrogen dioxide from gas stoves, formaldehyde from particleboard and urea-formaldehyde foam insulation, and radon from various building materials—are currently receiving considerable attention in the context of the potential health risks that are associated with reduced infiltration and ventilation rates. It is likely that some increased health risk will accompany an increase in indoor contaminant exposure; hence, it is desirable not to allow these concentrations to rise above human tolerance levels. There are several possible ways of circumventing increased health risks without compromising energy conservation considerations.

Bertell, Rosalie, Ph.D. (1984). Handbook for Estimating Health Effects From Exposure to Ionizing Radiation. Institute of Concern for Public Health, 67 Mowat Avenue, Suite 343 Toronto, Ontario M6K 3E3.

This handbook contains information which enables the translation of human radiation exposure levels into probable health effects, for example, a labor union faced with evaluating a list of worker radiation exposures, or a physician deciding on the risks and benefits of various X-ray procedures. Some radioactive materials emit rays which can penetrate the body even though the materials remain outside. The most common are gamma and X-ray emitters. Some beta particles are able to penetrate the outer skin layer and do some internal damage to humans. When radioactive particles are taken within the body through inhalation or ingestion, they can do more severe local biological damage to the cells immediately surrounding the bone, organ or tissue in which they lodge.

Berwick, Donald M.; Komaroff, Anthony L. (1982). Cost Effectiveness of Lead Screening. New England Journal of Medicine, pp 1392 to 1398; June 1982.

Lead screening programs may reduce childhood disabilities, but at what cost? Through a review of the literature, the authors performed a cost-effectiveness analysis in which the costs, savings, and health benefits of two lead screening strategies were compared with each other and with a strategy of no screening in a population of three-year-old children. When the prevalence of lead poisoning among the children screened is 7 percent or more, it is estimated that free screening averts morbidity and results in net savings: it is both better and cheaper than no screening. At all prevalence rates, free erythrocyte protoporphyrin screening is most cost effective type.

Besch, Emerson L.; Dart, David M.; Goldman, Ralph F.; Horton, Robert J.M.; Logsdon, Robert F.; McNall, Preston E. Jr.; McQuiston, Faye C.; Turk, Amos; Woods, James E. (1981). Position Paper on Legionellosis: Part I and Part II. American Society of Heating, Refrigerating and Air Conditioning Engineers July 1981 and February, 1981.

> This is the report of an Ad Hoc Committee. It discusses the micro-organism which causes the disease which is found in wet soil or water such as is found in lakes, domestic water taps, sewage treatment facilities and recreational waters. It is amplified by such things as cooling towers, humidifiers, hot water systems and is thought to be transported by airborne means. Treatment of water is discussed as an amplifier control. Filtering of the make-up air for a building is practical and can provide removal efficiency aproaching 100%. Within buildings, special attention should be given to warm and/or standing water such as in humidifiers, shower heads, air conditioning ductwork. Research needs are discussed such as isolating the bacteria in their natural environment, methods of practical measurements of airborne concentrations, control strategies for amplifiers, threshold concentrations for infection, effectiveness of filtration, and susceptibility of various populations.

Billings, Charles E.; Vanderslice, Sandra F. (1982). Methods for Control of Indoor Air Quality: from Indoor Air Pollution; Spengler, John—editor; pp. 497-504. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

> Keywords: buildings; ventilation; air filters; indoor air pollution; risk assessment;

Bjorklid, Pia (1985). Children's Outdoor Environment From the Perspective of Environmental and Developmental Psychology. Children Within Environments, Chapter 6, pp 91 - 106; Garling, Tommy and Valsiner, Jaan editors; Plenum Press; 1985.

> Some of the findings are reviewed of a study (Bjorklid, 1982) which in 1969 was initiated by the Swedish Public Committee on Children's Outdoor Environment. The purpose of the study was to provide a frequency description of the environment-behaviour interactions on two housing estates of children ages 4 to 12. Boys spent much more time outdoors than girls. Some implications are drawn concerning the importance of the outdoor environment for children's social and psychological development. Examples of factors in the physical environment that restrict outdoor stay are high-rise buildings, traffic, long distances to attractive play spaces, and bad weather. An indirect social factor is a lack of suitable activities for adults. Recommendations include setting aside all open spaces on housing estates for play, providing playgrounds with playleaders, allowing children opportunities for concrete action upon the environment, helping them to develop a sense of competence, and encouraging them actively to bring about changes in the environment.

Blume, Kathleen A. (1976). Air Pollution in the Schools. from Clinical Ecology, Lawrence D. Dickey ed; chapter 39; pp. 369-376; Charles C. Thomas; 1976.

> There are many sources of indoor air pollution in our schools. Many children are reacting to a toxic exposure when they become irritable, excited, depressed, unreasonable or antisocial. Many children who demonstrate an inability to learn, who are slow learners; who have reduced reading comprehension and speed, reduced memory, or who show mental confusion, could be satisfactory students if there were no toxic fumes present in their school environment. The major causes of air contamination in schools are found to be aerosol sprays, janitorial supplies, scholastic supplies, building materials and furnishings, heating, ventilating and cooking equipment, cosmetics and toiletries, smoking and school buses.

Blumenthal, James A; Burg, Matthew M.; Roark, Steven F. (1986). Behavioral Approaches to Primary and Secondary Prevention of Coronary Heart Disease: from Handbook of Prevention; Edelstein, Barry A. and Michelson, Larry, editors. Plenum Press, New York, 1986; pp. 287 - 306.

> Research has demonstrated that risk factors for the development of coronary heart disease can be modified using behavioral interventions. Hypertension, hyperlipidemia, obesity, cigarette smoking, and Type A behavior all have been shown to be potentially modifiable in this way. However, with the exception of smoking, there is inconclusive evidence that behavioral interventions will prevent it in later life or that such intervention will reduce morbidity or mortality once it has become evident. The most prudent approach is to identify children at risk while relying on a variety of educational and behavior change strategies to promote wellness behaviors. Education of adults is also important in a variety of settings. In addition to clinical trials for primary and secondary prevention, future research should include models to study mechanisms by which behavioral factors link to heart disease. Public health policy needs to be redirected toward preventing illness rather than treating it.

Blumenthal, Monica D.; Davie, James W. (1980). Dizziness and Falling in Elderly Psychiatric Outpatients. American Journal of Psychiatry, Vol. 137, No. 2, pp. 203-206; February 1980; American Psychiatric Assoc.

> Keywords: elderly; ambulatory care; blood pressure; effects of drugs; coronary disease; dizziness; equilibrium; female; psychiatric hospitals; orthostatic hypotension; mental disorders; middle age; psychotropic drugs;

Boegman, R.J.; Bates, L.A. (1984). Neurotoxicity of Aluminum. Can J Physiol Pharmacol, No. 62, pp. 1010-1014; August 1984; National Research Council of Canada.

> The toxic effects of aluminum, the earth's most abundant metal, on the nervous system are reviewed. Soluable Al salts can be absorbed from the stomach; nutritional deficiencies of calcium and magnesium can enhance Al absorption. Al is deposited in the gray matter of the brain and affects many neuronal processes: it stimulates protein synthesis, inhibits axonal transport, and increases the breakdown, while decreasing the re-uptake, of neurotransmitters. Behavioural consequences may include memory loss, impaired motor coordination, decreased learning ability, psychotic reactions, and seizures. Common sources of Al include antacids, deodrants, paper towels, drinking water (Al sulfate is used in water purification), airborne dust, and food. High levels of Al in soil, and acid rain, which can leach Al from the soil, increase the level of Al and tend to decrease the amount of selenium in locally grown plants.

Boer, J. de (1986). Community Response to Soil Pollution; A Model of Parallel Processes: Part D: Community Processes and Social Participation. Methods and Experiences in Impact Assessment; Part D1; pp 185 - 200; Reidel Publishing Company, Dordrecht The Netherlands; 1986.

> A field study investigated the perception of environmental hazards in residential areas polluted by chemical wastes. Soil pollution is an important problem in The Netherlands. In four cases of soil pollution experiences of the inhabitants, the information process, social and medical assistance and participation by the inhabitants are studied. The data were collected in comprehensive interviews with involved professionals. Increasing understanding of individual reactions to cases of soil pollution could have important consequences for policy. The Authorities could improve their handling of cases such as this by improving the information provided to residents, improving citizen participation, and acknowledging their responsibility for future living conditions in the affected neighbourhoods.

Bokina, A.I.; Eksler, N.D.; Semenenko, A.D.; Merkur'yeva, R.V. (1976). Investigation of the Mechanism of Action of Atmospheric Pollutants on the Central Nervous System and Comparative Evaluation of Methods of Study. Environmental Health Perspectives, Vol. 13, pp. 37-42; National Institutes of Health; 1976.

> Some aspects of the mechanism of action of atmospheric pollutants (acetone, benzene, ammonia, formaldehyde and ozone) on the central nervous system were studied by using methods of functional electroencephalography. Effects of the compounds were determined for the various structures of the cerebral cortex of experimental animals. The most sensitive structures were those which were first to associate in the reaction to

toxic agents. EEG indices were observed which were indicative of an adverse effect. During long-term action of toxic materials at low concentrations, changes were observed in the parameters of the primary and secondary responses of the visual evoked potential which were indicative of a disturbance of the cortical inhibition processes. This can be considered one effect of atmospheric pollutants at low concentrations.

Bonham, Gordon Scott; Wilson, Ronald W. (1981). Children's Health in Families with Cigarette Smokers. American Journal of Public Health, Vol. 71, No. 3, pp. 290-293; March 1981.

Recent studies have indicated higher rates of certain respiratory conditions among children who live in households with adults who smoke cigarettes. This paper analyzes data from the 1970 National Health Interview Survey. Children in families with no smokers had an average of 1.1 fewer restricted activity days and 0.8 fewer bed disability days per year than did children in families with two smokers. Children in families with one smoker were in between. Acute respiratory illness accounted for the difference in disability days among children in families with different smoking characteristics. Family smoking was also measured by the combined number of cigarettes smoked by adults; children in families which smoked 45 or more cigarettes a day had 1.9 more restricted activity days and 0.9 more bed disability days due to acute respiratory conditions than did children in families who did not smoke cigarettes. The age of the child, the number of adults in the family, the education of the family head, and the family income were all controlled and did not eliminate the relationship between children's health and family smoking.

Borland, Barry L.; Rudolph, Joseph P. (1975). Relative Effects of Low Socio-Economic Status, Parental Smoking and Poor Scholastic Performance on Smoking Among High-School Students. Soc. Sci & Med, Vol. 9, pp 27 - 30; Pergamon Press; 1975.

Previous studies have established that parental smoking, socio-economic status and scholastic performance are all related to smoking in high school students. A study of 1814 students at a high school in Western Pennsylvania confirmed the three factors previously identified as factors influencing the smoking of teenagers. Findings of this study also showed that of the three factors, scholastic performance was clearly the strongest, with parental smoking next in strength and socio-economic status a weak third. These results are discussed in relation to similar findings on antisocial behavior in teenagers.

Borrows, Peter; Turner, Richard (1984). How Safe is Science in Schools?. New Scientist, No. 13, pp. 12-15; September 1984.

Safety regulations for school science laboratories are going unobserved for lack of funds. But school is the ideal place to instill a lifelong awareness of potential hazards.

Boulding, Elise (1979). Children's Rights and the Wheel of Life. Transaction Books; 1979.

> Although they make significant contributions to the world's work and well-being, often despite severe legal and economic handicaps and social victimization, people under age twenty-one and over age sixty are excluded sectors of the world population. Striking at the roots of ageism strikes at the root pathology of human relationship: the drive to dominate and to mold. The centres of power will always let the young and the old be the first to go hungry, especially if they are poor, and most of the world's poor are either very young or very old. This book examines the active, participatory roles of children in their respective societies and then looks at children as objects of legal protection and explores the extent to which this protection helps or hinders their welfare. An extensive bibliography is included.

Bourne, Patricia Gerald; Medrich, Elliot A.; Steadwell, Louis; Barr, Donald (1971). Day Care Nightmare — A Child-Centered View of Child Care: Working Paper No. 145. Institute of Urban & Regional Development, University of California; February, 1971.

> Child care services need to be child-centered rather than focused on the needs of adults in the labour force. When a child's eligibility for a program is tied to his or her mother's participation in a training program or a particular job, frequent damage to the child's sense of stability and security is inevitable. When franchisers and industry, in search of cheap programs, seek to avoid expensive public agency standards, it is the children and their chances for emotional and educational development who are the losers. A set of criteria needs to be formulated based on the needs of children for extra-parental care. The existing constellation of services needs to be looked at as a system and evaluated as to whether that system is able to respond to the current and evolving needs of children.

Bowles, A.M.; Shirtliffe, C.J. (1981). Development of a Canadian Standard for Urea Formaldehyde Thermal Wall Insulation: reprinted from Thermal Insulation Peformance, American Society for Testing and Materials, Special Technical Publication 718, 1980, pp. 361-394. National Research Council of Canada, Division of Building Research, Ottawa Canada K1A 0R6; 1981.

> Keywords: urea formaldehyde; foam; insulation; plastic; thermal insulation; material standards; formaldehyde; fungal growth; shrinkage; freeze-thaw; hydrolysis; field investigations; pH; derating; thermal resistance; NHW?

Bozzelli, Joseph W.; Russell, Joel F. (1981). Airborne Asbestos Levels in Several School Buildings Before and After Bulk Asbestos Removal. Intern. J. Environmental Studies, Vol. 20, pp. 27-30; 1982; Gordon and Breach Science Publishers, Inc.

Airborne particulate samples were collected in several public schools before and after friable asbestos containing (5-20 percent) insulation material had been removed from the ceiling areas. Transmission electron microscopy with selected area electron diffraction (SAED) was used for fiber identification and counting. Asbestos fiber concentrations in the air were in the range 5-40 ng/M 3 before removal of the friable asbestos ceiling insulation. The airborne asbestos concentrations approximately one week after removal showed reductions of 56 to 90 percent.

Bradley, Eileen; Erman, Tahire; Fanos, Irene; Gottlieb, Nina; Jackson, Gerald, Mikula, Amy; Rivlin, Leanne; Rosenblum, Illith; Sorensen, Lena; Walker, Peter; Wolfe, Maxine (1986). Workshop; Diversity as an Environmental Issue: Introduction. Environmental Design Research Association, April 1986.

The working group is composed of 11 participants — women and men, from different cultural backgrounds, including Irish, Jewish, Black American, Danish, Turkish, Israeli, Polish, Greek, Protestant, Catholic, and Moslem. Some were immigrants, others were US-born. Economics, age, family structure, sexual orientation, family structure, education, and work experience were all diverse. Their commonality was the value they placed on diversity, on exploring differences and similarities, and understanding ways in which as individuals and design researchers they could integrate that value into their work.

In order to help create environments which will sustain and support the positive or change the negative realities in our lives, a point of departure is needed that acknowledges and sustains difference and diversity, both in people and in environments, while building community based on acknowledging difference. In order to do this, it is necessary to understand the ways in which we have been taught to ignore diversity and to develop ways of unlearning this limited way of thinking and acting. There is an umbrella of oppression: within our society different groups have different amounts of power and a person could in one respect be part of a dominating group, for example, white or male, and at the same time be part of an oppressed group, for example, a white woman or a Black male.

Bradley, Eileen; Erman, Tahire; Fanos, Irene; Gottlieb, Nina; Jackson, Gerald, Mikula, Amy; Rivlin, Leanne; Rosenblum, Illith; Sorensen, Lena; Walker, Peter; Wolfe, Maxine (1986). From Stereotyping to Revealing Diversity; The Role of Language in Environmental Research. from Diversity as an Environment Issue Workshop; Environmental Design Research Association, April 1986.

Words are frequently used to perpetuate the status quo in discrimination against women, ethnic/racial groups, people with disabilities, and so on. Making words more accurately describe the specific population under discussion will weaken overt and insidious biases by causing both writer and reader to think about people and environments in a less preconceived, stereotypical way. The first step in the direction of changing the status quo could have the researcher asking a person, ."How would you prefer to be described?"

Bradley, Eileen; Wolfe, Maxine; (1987). Where Do the 64-Year-Old Jewish Latina Lesbians Live?: Diversity of People as an Environmental Issue. Proceedings of the EDRA 18 Conference, Ottawa, Canada, May 29-June 2, 1987, pp. 175-181, edited by Joan Harvey and Don Henning; Environmental Design Research Association, Washington, D.C.; 1987.

> This paper analyzes titles and contents of published EDRA research material, based on a framework which acknowledges and supports the diversity of people. The findings show that we are ignoring diversity by homogenization, invisibility, treating people as deviant, specifying non-dominant groups and not specifying dominant groups, only focusing on a non-dominant group in comparison to a dominant group, inferring membership in a category on spurious grounds, and using descriptors as "throwaways", neither defining them nor relating them to the issues at hand, and supporting a reader's use of normative images. The authors discuss the relationship between these findings and issues of oppression, and show how ignoring the diversity of people affects environmental descriptors and explanation of phenomena.

Bradley, Jim (1987). Remarks to the Canadian Society for Clinical Ecology and Environmental Medicine. unpublished speech to the Canadian Society for Clinical Ecology and Environmental Medicine; April 3, 1987.

> Environmentally sensitive people are the first to feel the effects of low-level environmental contaminants. These people should not be forgotten in pollution control decisions. Source reduction, not dilution is the solution. Alternatives to agricultural chemicals must be developed, chemical input into drinking water sources from polluting industries must be reduced, and sulphur dioxide emissions must be reduced, among other actions.

Breysse, Peter A. (1979). Formaldehyde Exposure in Mobile Homes and Conventional Homes. Presented at the 43rd Annual Education Conference of the National Environmental Health Association, June 23-28, 1979.

> Keywords: formaldehyde; mobile homes; health hazards; indoor air pollution;

Breysse, Peter A. (1981). The Health Cost of 'Tight' Homes. Journal of the American Medical Assoc., Vol. 245, No. 3, pp. 267-268, Jan. 16 1981; 535 No. Dearborn St., Chicago IL 60610.

> Keywords: airtight homes; health cost

Bridbord, Kenneth; Brubaker, Paul E.; Gay, Bruce, Jr.; French, Jean G. (1975). Exposure to Halogenated Hydrocarbons in the Indoor Environment. Environmental Health Perspectives, Vol. 11, pp. 215-220; June 1975.

> Keywords: vinyl chloride; carcinogen; aerosol propellants; freons; ISO-butane; propane; Trichloroethane; methylene chloride; carbon tetrachloride; cardiac arrhythmia; carbon monoxide; metabolism;

Broadbent, D.E.; Broadbent, M.H.P.; Male, J.C.; Jones, M.R.L. (1985). Health of Workers Exposed to Electric Fields. British Journal of Industrial Medicine, Volume 42, 1985; pp. 75-84;.

> The results of health questionnaire interviews with 390 electrical power transmission and distribution workers are reported, along with long term estimates of their exposure to 50 Hz electric fields, and short term measurements of actual exposure, for 287 of them. After allowing for the effects of job and location, the authors found no significant correlations of health with the subjects' measured or estimated exposure to electromagnetic fields. The general level of health was higher than found in manual workers in other industries, but there were significant differences in the health measures between different categories of job, different parts of the country, and in association with factors such as overtime, working alone, or frequently changing shift.

Brundrett, G.W. (1979). Maintenance of Spray Humidifiers. US Govt.; February 1979.

> Keywords: spray humidifiers; occupational diseases; indoor air pollution; microorganisms; air conditioning equipment; culture medium; dust; NHW

Budd, Roger A.; Czerski, Przemyslaw; (1985). Modulation of Mammalian Immunity by Electromagnetic Radiation. Journal of Microwave Power, Volume 20, No. 1, 1985; pp. 217-231;.

> This paper examines reports that electromagnetic radiation alters the function of mammalian immune systems. The authors conclude that there is no convincing evidence that electromagnetic radiation effects on the human immune system are a health hazard. Available data indicate that electromagnetic radiation exposure does not affect the ability of cells of the immune system to respond to a subsequent challenge; however, the time-course and magnitude of the response may be affected by exposure following stimulation. Research to date provided evidence that at least at some frequencies and/or amplitude and pulse modulations, the site of primary interaction of electromagnetic radiation is at the cell membrane. The authors conclude that electromagnetic radiation alters the responses of the immune system, but that much of the literature on the subject is confusing, and contradictory. They found it difficult to assess the literature in terms of its implications to human health.

Budnitz, R.J.; Berk, J.V.; Hollowell, C.D.; Nazaroff, W.W.; Nero, A.V.; Rosenfeld, A.H. (1979). Human Disease from Radon Exposures: The Impact of Energy Conservation in Residential Buildings. Energy and Buildings, Vol. 2, No. 3, pp. 209-215; August 1979; Elsevier Sequoia S.A., Lausanne Switzerland.

> Keywords: houses; energy conservation; radon; environmental impact; air pollution; indoor air pollution; public health;

Cain, W.S.; Leaderer, B.P. (1982). Ventilation Requirements in Occupied Spaces During Smoking and Nonsmoking Occupancy: from Indoor Air Pollution; Spengler, John—editor. Environ. Int., Vol. 8, No. 1/6, pp. 505-514; 1982; Pergamon Press, Oxford, Toronto.

> Ventilation requirements in occupied spaces have traditionally derived largely from odor control. The requirements have rested on the notion that an environment that seems subjectively acceptable to a visitor will in fact be healthful and comfortable for both occupant and visitor. They have also derived from criterion concentrations of notable contaminants such as carbon dioxide. This investigation looked again at both sensory and physical criteria of acceptability, paying particular attention to the difference between smoking and nonsmoking occupancy in a well-controlled environmental chamber. More than 200 visitors made judgements of odor intensity and acceptability under various conditions of occupancy. The results implied that under nonsmoking conditions and moderate humidity, only about 7.5 cfm of fresh air per occupant sufficed to satisfy visitors, but that under smoking conditions at least 5 times as much fresh air is necessary.

Calabrese, Dorothy V. (1986). Fungi: Molds and Yeasts A World of New Discoveries for the Sensitive Patient. Serendipity Environmental Medicine Newsletter, Vol. 1, No. 4, pp 1 - 6; November, 1986.

> Very little information is available in the medical literature about the health effects of molds and yeasts, compared to the wealth of knowledge that has been gained by clinicians who have been specifically treating mold sensitive individuals. This is a major problem in modern medicine: physicians look for what they have been trained to see, rather than practise the true art of medicine which is being creative and using basic knowledge as a springboard to further discoveries about patients' problems.
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> Sensitivities to molds can cause a variety of symptoms such as headaches, ear and hearing problems, respiratory problems like bronchitis and asthma, gastrointestinal difficulties, weight gain and loss, food cravings, as well as dermatologic, muscular, urologic, and neuropsychiatric symptoms.

Calabrese, Dorothy V. (1986). Concept of Total Load: Man and His Environment. Serendipity Environmental Medicine Newsletter, Vol. 1, No. 2, p 1; September, 1986.

> A person's total load of exposures to toxic and allergenic substances is comprised of external load factors as well as internal individual factors. There are many factors simultaneously at work in a system that varies considerably with each individual.

Calabrese, E.J. (1978). Pollutants and High-Risk Groups: The Biological Basis of Increased Human Susceptibility to Environmental and Occupational Pollutants. John Wiley & Sons, New York, 1978.

> To be at high risk with respect to a pollutant, an individual would experience the adverse health effects of the pollutant significantly before the general population because of some genetic, developmental, nutritional, physiological, behavioural, psychological, or disease state factors present which predispose the individual to the harmful effects. The author stresses that at present, the identification and especially the quantification of the numbers of individuals at high risk in the population in question is still in its rudimentary stages. The question addressed is: what percentage of the population is actually being protected from the toxic or carcinogenic activities of a pollutant, by clean air standards.

Calabrese, E.J. (1978). Methodological Approaches to Deriving Environmental and Occupational Health Standards. John Wiley & Sons, New York, 1978.

> This work discusses the methodological bases for deriving pollutant exposure standards, with particular reference to the fact that there is a high degree of variability in the response of humans to different levels of air pollutants.

Calabrese, Edward J. (1979). The Influence of Ambient Ozone on the Incidence of Bone Fractures Especially Among the Elderly. Medical Hypotheses 5, pp. 201-207, 1979.

> Keywords: ozone; ultraviolet radiation; vitamin D; osteomalacia; hypocalcemia; rickets;

Calabrese, E.J. (1980). Nutrition and Environmental Health: The Influence of Nutritional Status on Pollutant Toxicity and Carcinogenicity; Volume 1 - The Vitamins, and Volume 2 - Minerals and Macronutrients. John Wiley & Sons, 1980.

> This two-volume work discusses the complex interaction of nutrition and pollutants on human health, itemizing research results which reveal the positive and negative effects of vitamins, minerals and other nutrients on a person's sensitivity to the adverse effects of pollutants.

Camp, Janice E.; and Morgan, Michael S. (1985). Upper Respiratory Irritation from Carbonless Copy Paper. Proceedings, 3rd International Conference on Indoor Air Quality and Climate, held in Stockholm, Sweden, August 20-24, 1984. Volume 3: Sensory and Hyperreactivity Reactions to Sick Buildings, pp. 393-396.

Clerical workers were given controlled exposures to fumes from carbonless copy paper forms approximating ambient air levels associated with normal daily usage. Nasal congestion was assessed by measuring the nasal impedance to air flow. The results provided quantitative evidence that exposure to airborne emissions of carbonless copy forms can cause acute nasal congestion.

Campbell, Dugal (1986). Research Priorities in Mental Health: Commentary. Can. J. Psychiatry, Vol. 31, November 1986; pp 746 - 749.

This paper proposes a scheme for estimating the relative merits of different branches of research within the whole field of mental health. The scheme is based upon 3 factors: the need for research in a particular topic; the possibilities of doing good science; the estimated time to a clinical payoff. It is argued that reasonable assessments of these 3 factors can be combined to give a relative weight to any particular research area. The argument is also put that one way to obtain more funds for mental health research overall is to improve the ordering of the different areas within the field of mental health.

Campbell, J.S.; Day, James; Clary, John J.; Kinloch, David; and Golberg, Leon; (1981). Final Report of the Department of National Health and Welfare Expert Advisory Committee on Urea-Formaldehyde Foam Insulation. Department of National Health and Welfare, Ottawa, Canada, April 1981.

The Committee declared that compared to other building materials, UFFI is an unstable material which deteriorates, and the rate of deterioration is dependent on the conditions to which it is exposed. Degradation results in the release of formaldehyde gas which can be carried to the living space by air leakage. Where the cavity containing the foam has not dried properly after installation, fungus growth may occur leading to possible structural and health problems.

The Committee noted the role of formaldehyde as a potential carcinogen, and irritant, and a potential allergen affecting skin and ocular and nasal mucous membranes as well as the lungs. They note that some individuals may become highly responsive to low doses leading to debilitating dermatitis, rhinitis, conjunctivitis and asthma. Superimposed on these health considerations is the likelihood of respiratory sensitization from exposure to fungal spores. The Committee states that it is not prepared to recommend any level of formaldehyde exposure that it safe. UFFI was banned under the Hazardous Products Act, Section 8b.

Campbell, Joan (1983). Ambient Stressors. Environment and Behavior, Vol 15, No. 3, pp. 355-380; May 1983.

The author concludes from previous research on environmental stressors that there is ample reason to presume that environmental stressors interact with numerous psychological variables to produce adverse effects on health and well-being. Evidence suggests that psychological factors such as perceived control, information about the stressor, coping resources, and certain personality traits all may mediate the influence of physical environmental stressors on human well-being. The author argues that it is "heuristically useful to view global, chronic phenomena such as air pollution, community noise, and crowding as a distinct class of stressors, namely ambient stressors". Such stressors represent noxious stimulation and place demands upon us to cope. Ambient stressors over the long run are expected to affect several dimensions of human well-being, including motivation, emotions, attention, somatic health, and behaviour.

Campbell, K.L; George, E.L.; Washington, LS. Jr. (1980). Enhanced Susceptibility to Infection in Mice After Exposure to Dilute Exhaust from Light Duty Diesel Engines. from Health Effects of Diesel Engine Emissions, Vol. 2; pp. 772-785; Pepelko, W.E., Danner, R.M., Clarke, N.A., editors; US Environmental Protection Agency, November 1980.

A series of experiments was conducted in which groups of mice were first exposed for various durations to diluted exhaust from light duty diesel engines and then briefly to an infectious aerosol generated by nebulizing cultures of a bacterial pathogen (streptococcus). Typically, post-infection mortality was significantly greater in groups exposed to exhaust than in their corresponding control groups exposed to purified air only. Data of recent diesel and of past diesel- and catalyst-treated gasoline engine exhaust experiments suggest a somewhat greater excess mortality from enhanced susceptibility to bacterial infection in mice exposed to diesel exhaust than in those exposed to catalytic gasoline exhaust. Limited data on acute tests of NO2 and acrolein vapor alone suggest that the infectivity-enhancing effect of diesel exhaust could be accounted for in large part by these components. Exposures to diesel exhaust, NO2, or acrolein did not enhance the mortality to a viral pathogen.

Canada Mortgage and Housing Corporation (1983). Housing and the Elderly. Canada Mortgage and Housing Corporation; Ottawa ON; 1983.

This is an advisory document dealing with desirable standards of housing designed specifically for elderly people who are sufficiently healthy and mobile to live independently in self-contained dwelling units. Its purpose is to assist those intending to organize, finance, design, or build housing for the elderly. Designs compensate for health and mobility limitations; ensure affordability and ease of access to public facilities; allow for socialization, communication, and interaction; and provide a sense of home for residents.

Canadian Advisory Council on the Status of Women (1987). Integration and Participation: Women's Work in the Home and in the Labour Force. Canadian Advisory Council on the Status of Women; 1987.

> Much of this book reviews the legal, regulatory, and practical considerations that govern women's economic status and the quality of their working lives, whether they work at home, in the paid labour force, or both. Issues examined include marriage and divorce, conditions of work, unemployment, health and safety, unionization, and pensions.

Canadian Advisory Council on the Status of Women (1987). No Vacancies! Women and Unemployment. Integration and Participation; chapter 3, pp 37 - 51; Canadian Advisory Council on the Status of Women; 1987.

> Unemployment causes the woman in the household to tap emotional resources to keep the home together. Feelings of guilt, anger and despair, turned inward or outward, are a powerful part of the chronic umemployment picture. When personal and financial resources are stretched to the breaking point, women as a group are affected particularly severely, as they continue to try to provide mothering, support and household comforts in an atmosphere of tension and strain.

Canadian Association for Children and Adults with Learning Disabilities (1984). A Brief on Emission Control Standards. Canadian Association for Children and Adults With Learning Disabilities, Kildare House, 323 Chapel, suite 101, Ottawa Canada K1N 7Z2; September 1984.

> This submission focuses on the effects of auto emissions on child health, specifically concerning their potential for adverse effects on brain development and function. Minimal brain dysfunction affects an estimated 10 to 15% of the population today. Lead emissions from cars are one of the major causes. Carbon monoxide is a known teratogen and another component of automobile exhaust that should be better regulated. Acid precipitation and leaching of heavy metals such as mercury, cadmium and aluminum which are known neurotoxins is another major problem which should be better monitored.

Canadian Centre for Occupational Health and Safety (1985). The Trade Names Data Base at CCOHS. Canadian Centre for Occupational Health & Safety, 250 Main St. E., Hamilton ON Canada L8N 1H6; February 1985.

> This document describes the Trade Names Data Base which is a centralized source of current information on products used in Canadian workplaces. It is a computerized file of material safety data sheets supplied by manufacturers and distributors.

Canadian Home and School & Parent-Teacher Federation (1986). Preventing Child Abuse: Everybody's Responsibility. Canadian Home and School & Parent-Teacher Federation; 1986.

> Child abuse is any act by an adult, or the omission of any act, which results in harm to a child. It can include physical, sexual, and emotional abuse or neglect. Physical abuse involves any kind of injury or extreme punishment of a child and also includes the failure to provide a child with the food, clothing, shelter, and health care needed for the child's optimum development. Sexual abuse is the exploitation of a child by an adult for sexual gratification and includes incest, sexual molestation, sexual assault, and the exploitation of the child for the purposes of pornography or prostitution. Emotional abuse or neglect is the constant ill-treatment of a child through the witholding of affection or through repeated humiliations. The organization has prepared a resource kit on child abuse and neglect aimed at promoting greater public awareness and understanding of the problem; encouraging individuals and community groups to become involved in positive action on the issue; and helping to prevent child abuse by showing support for families in the community.

Canadian Mental Health Association (1984). Work and Well-Being: The Changing Realities of Employment: Cross-Canada Perspectives and an Emerging Agenda on Mental Health and the Workplace. Canadian Mental Health Association, Toronto ON; September, 1984.

> People who are unable to work undergo not only economic hardship, but also experience physical, psychological, and spiritual distress. In contrast, simply having a job is no guarantee of personal well-being. There are many factors in the workplace which may enhance or diminish our sense of well-being. This report is a result of action research in 5 communities across the country. The findings included, among many things, that most people have experienced negative workplace stress. Many of the work-associated pressures were found to be age-specific. Negative workplace stress affected women's personal physical and psychological health, due to the kind of work which they performed and their additional burden of family and household responsibilities. Skilled and unskilled manual labourers suffered the highest incidence of stress-related illnesses of all occupations. The issue for former psychiatric patients centres on access and opportunity.
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> During the next decade, an emerging priority in preventive mental health care will be to assess, anticipate, and respond to the social impacts of employment patterns. Government must establish a policy framework and program supports which would encourage positive mental health practices in both the public and private sectors. Many cooperative measures can be taken by employers and unions to respond sensitively and adaptively to the mental health needs of employees. Individual employees share a responsibility for greater sensitivity, consideration and tolerance of differentness. Strictly self-interested approaches must be abandoned in favour of concerted, collaborative action among all the parties involved. An extensive bibliography is included.

Canadian Mental Health Association (1987). Women and Mental Health in Canada: Strategies for Change. Canadian Mental Health Association, National Office, Toronto ON; April 1987.

> Although the majority of those using mental health services are women, relatively little attention has been paid to their special or unique needs. The report concludes that significant improvements in women's health and well-being can be achieved only if there are general gains in the status of women in education, employment, and representation in decision-making roles. Actions directed to improving women's mental health need to be integrated and coordinated with efforts to improve women's social status and women should be active participants in the process of developing mental health programs at all levels and stages. It is recommended that funding for women's mental health research should be made a priority and that a conference be organized to identify research priorities. Health and Welfare Canada should develop appropriate materials for the promotion of information about women and mental health for use in training health professionals. Other recommendations involve promoting the awareness of sexual harassment, increased funding for rape crisis centres and shelters for battered women, the development of more comprehensive standards for occupational health and safety, assisting more women to seek training in the field of mental health planning and policy development, support of initiatives to improve women's social and economic status, and child care. A comprehensive list of references is included.

Cannon, Margaret (1987). Give Them Air: Breathe New Life into Your Workers' Productivity. Canadian Business, pp. 58-62, 95-99; April 1987.

> This author cites recent investigations of 'sick building syndrome', which suggest that employees who work in sealed office buildings make more mistakes, have more office accidents, take longer to do tasks and are sick more often.

Brodsky, C.M. (1983). Allergic to Everything: A Medical Subculture. Psychosomatics, Vol 24, 1983, pp. 731-742.

Carp, Frances M. (1967). The Impact of Environment on Old People. Gerontologist; Vol. 7, No. 1, pp 106 - 108, 135; 1967.

> Analysis of data on elderly applicants for new housing showed dramatic improvement deriving from a new life setting: more favorable attitudes, better mental health and social life, diminished interpersonal frictions, greater emotional independence, and fewer health complaints. The median age of the applicants was over 72. Of the 352 individuals, 204 were

successful applicants and 148 were not. Unsuccessful applicants showed little change in behavioral attitudes. Results suggest that new, improved settings foster new friendships and social activity, that old people are not necessarily rigid in behavior.

Carson, Bonnie L.; McCann, Joy L.; Ellis, Harry V. III; Herndon, Betty L.; Baker, Larry H. (1981). Methanol Health Effects. Environmental Protection Agency; December 1981.

Health effects literature primarily related to inhalation exposure to methanol was collected, evaluated, tabulated, and summarized. Approx. 160 documents were collected from computerized and manual literature searches covering the period 1901-1980. Pharmacologists and an MD epidemiologist rated the documents according to their applicability to the study and their methodology. The approximately 25 documents considered useful for deriving a range of concern for human exposure to methanol from automotive emissions were tabulated. The pages of tables detail the results of acute, repeated dose, and chronic testing of mice, rats, rabbits, dogs, monkeys and humans as well as human occupational studies. A brief summary of oral and skin absorption toxicity is included. Most of the documents evaluated are described in an annotated bibliography.

Cassel, John (1977). The Relation of the Urban Environment to Health: Towards a Conceptual Frame and a Research Strategy: A Report of the Inter-University Board of Collaborators. The Effect of the Man-Made Environment on Health and Behavior, Chapter 5, pp 129 - 142; Centre for Disease Control, Public Health Service, U.S. Dept. of Health Education and Welfare, Atlanta GA; 1977; Hinkle, Lawrence E., Loring, William C., ed.

Intervention research is proposed by which a partnership would be formed between those agencies of society charged with the task of improving the quality of the urban environment and research scientists largely drawn from academic institutions. Such a partnership would have the responsibility for introducing changes in physical aspects of housing and the residential neighborhood, and would use this entree as a means for deliberate alteration in some social factors as experimental variables. Thus, improvements in housing could be introduced with greater and lesser degrees of community participation, and with varying degrees of community control and decision making, with and without attemps to modify use, crowding, etc.

Cassidy, Michael W.A. (1970). Social Indicators: Accidents and the Home Environment: working paper. unknown; October 1970.

This paper draws together two apparently disconnected topics: first, the search for ways of evaluating the quality of physical environment, and second, the use of accident statistics as social indicators. Each of these is covered separately, but the main focus will be on whether data on the incidence of home accidents can be used to indicate the quality of the home environment. A good theory about environmental constraints has not yet been developed. Most attempts to develop such a theory have themselves been constrained by avoidance of the most obvious limitations on interaction. Little attention has been paid to the legal, political, and economic constraints on any activities undertaken. The conflict of attitudes and expectations between people in different contextual relations with the environment — the employee compared with the manager, owner compared with renter, user compared with passer-by — clearly needs more explicit recognition and theoretical treatment.

Catalano (198?). Health, Behavior and the Community: An Ecological perspective. Pergamon Press, 198?.

In the past, public health was concerned with health problems traceable to germs. But recently, illness has been more related to man-made pollutants, safety hazards, and individual resistance. An ecological paradigm is suggested for public health. It would assume, among other things, that an individual becomes ill when he or she cannot resist or avoid biological organisms and their by products, pollutants, or safety hazards; that resistance is lowered by stress; that the type of health problems attributable to pollutants will depend on the community's economic base and natural setting; and that health problems attributable to safety hazards are predictable from a community's economic base. It would also recognize that, in relation to genetic disease, in a population equally stressed and equally exposed to the same toxin, some persons will become ill and others not because of constitutional factors inherited from their parents; as stress levels rise in a given community, those with genetic predispositions will become ill before those with average or above average tolerance.

If public health is to contend with the illnesses precipitated by stress, pollutants, and safety hazards, it must become more familiar with the economic and social processes which shape the human community. The relationship among demographic and economic characteristics of a community and the health of its population will have to be carefully measured. Such measurement will facilitate both the remedial and preventive functions. Prediction is prerequisite to effective preparation.

Chalupiak, Sharon (1987). Telecommuting Means Never Being Late For Work. Toronto Computes, Vol. 3, No. 6; pp 4 - 6; June, 1987.

Running a computer-based business from a home office is a work alternative that allows flexibility and control over the working environment. Women and some men are able to integrate family and work lives when they work at home. Higher efficiency, economy, reduction of stress, and the elimination of commuting time are other benefits. Telecommuting has possibilities for creating employment for the disabled.

Chenier, Nancy Miller (1982). Reproductive Hazards at Work: Men, Women and the Fertility Gamble. Canadian Advisory Council on the Status of Women, Box 1541, Stn. B., Ottawa Canada K1P 5R5; December 1982.

Keywords: indoor air pollution; occupational health and safety; reproductive hazards;

Chester, Edward H.; Martinez-Catinchi, Fernando L.; Schwartz, Howard J.; Fleming, Gerald M.; McDonald, Eugene W. (1979). Patterns of Airway Reactivity to Asthma Produced by Exposure to Toluene Di-isocyanate: supplement. CHEST, Vol. 75, No. 2, pp. 229-231; February 1979.

Keywords: airway reactivity; asthma; toluene diisocyanate;

Chipman, Clark (1981). What Does it Mean When a Patient Falls? Part I: Pinpointing the Cause: Geriatric Emergencies section. Geriatrics, Vol. 36, No. 9, pp. 83-85; September 1981.

Keywords: accidents; aged; elderly; arrhythmia; dizziness; drugs; hemorrhage; hypotension; shoes; vertebrobasilar insufficiency; vision disorders;

Chisolm, J. Julian (1974). Heavy Metal Exposures: Toxicity From Metal-Metal Interactions, and Behavioral Effects. Pediatrics, Vol. 53, No. 5, Part 11, pp. 841-842; May 1974.

The extent to which pediatric exposure to a heavy metal contributes to the body burden of that metal must be considered. There is an important interaction between metals, including the essential ones, creating greater health hazards than would exposure to the metals individually. Thus the susceptibility of the young child to heavy metals may be related to diet, or the intake of protein, calcium or iron. Added to this is his or her rapid growth, which may be considered a stress factor. Recently there have been fewer children with acute disorders due to lead absorption; rather, it seems that children with infantile autism and other disabilities after normal development up to age 3 are occurring in greater numbers. In these cases, elevated blood lead levels were present and it is quite possible that their chronic increased lead absorption contributed to the behavioral disorders. They suggest that the role of lead should be considered in a wide variety of central nervous system disorders.

Chown, G.A.; Bowen, R.P.; Shirtliffe, C.J. (1981). Urea Formaldehyde Foam Insulation. National Research Council Canada, Division of Building Research, Ottawa Canada K1A 0R6; April 1981.

Urea formaldehyde foam insulation has been identified as causing medical problems for inhabitants and structural deterioration of buildings. Its use was banned by Health and Welfare Canada and the Department of Consumer and Corporate Affairs in 1980. The likelihood of health problems occuring depends on the duration of exposure to, and the concentration of, formaldehyde. This paper was prepared to help occupants of homes insulated with urea formaldehyde foam insulation to become familiar with basic information on the characteristics of the material, the factors that affect the severity of a situation, problems that may be encountered, remedial measures that can be taken, consequences of inappropriate actions, and sources of further information and assistance.

Christensen, Kathleen E. (1986). Impacts of Computer-Mediated Home-Based Work on Women and Their Families. accepted for publication by Office Technology and People, June 1986.

This is the report of a study of professional and clerical women who work at home. It concludes that women who work at home as a way of balancing child care and paid employment typically live in traditional two-parent households, where the father is the major breadwinner. These women work part-time, primarily for 'bonus' money and the psychological benefits of doing something other than being full-time home-maker and mother. Secondly, they do not work and care for their children simultaneously. They most often work when their partners can care for the children, or when their children are at school or asleep. When a professional woman has dependable, steady work, she is apt to employ paid child care. Third, corporations that hire home-based workers as independent contractors run the risk of creating second-class corporate citizens.

Christensen, Lary; Krietsch, Kelly; White, Beth; Stagner, Brian (1985). Impact of a Dietary Change on Emotional Distress. Journal of Abnormal Psychology, Vol. 94, No. 4, pp 565 - 579; 1985.

A single-subject design was used to investigate the impact of a dietary change on the emotional state of four individuals selected by means of the Behavioral Index of Metabolic Imbalance and a subsequent interview. The dietary change for three subjects consisted of a high protein-low carbohydrate diet void of sucrose and caffeine, whereas only caffeine and sucrose were eliminated for the fourth subject. Results revealed that subjects reported many symptoms and/or presented a distressed profile during baseline assessment. However, following a 2-week dietary change symptoms declined, and tests revealed a more stable and less distressed individual. Overall, the results suggest that a dietary change can remediate the emotional distress exhibited by some individuals.

Church, Kathryn (1986). From Consumer to Citizen: Building a Framework for Support. Canadian Mental Health Association; May, 1986.

This reports on the proceedings of a conference on mental health advocacy designed to encourage self-help development for people with mental disabilities. The conference structure was meant to give former and present users of mental health services a structure within which to participate in a process of joint planning for a system which would better respond to their needs.

Ciaranello, Roland; Lipton, Morris; Barchas, Jack; Barchas, Patricia R.; Bonica, John; Ferrario, Carlos; Levine, Seymour; Stein, Marvin (1983). Panel Report on Biological Substrates of Stress: Analysis and Implications of Research/A Study by the Institute of Medicine, National Academy of Sciences. Stress and Human Health; chapter 8, pp 189 - 254; Elliott, Glen R.; Eisdorfer, Carl ed; Springer Publishing Company, New York; 1983.

The biological mechanisms relating to stress are examined. Psychological and social stressors have been found to affect the immune response and disease susceptibility. The processes are complex and need further clarification. There is a great need for genetic studies to be integrated with work on environmentally caused variation in stress reactions. Different individuals can respond quite differently to the same environmental stressor, and patterns of immediate and delayed responses to stressors may differ markedly. An extensive bibliography is included.

Clark, Don (1987). The New Loving Someone Gay: Revised and Updated. Celestial Arts, PO Box 7327, Berkeley, CA USA 94707; 1987.

The author specifically addresses the task of helping someone who is non-gay overcome feelings of prejudice towards homosexual people. He notes that prejudice breeds on ignorance: in order to keep your prejudice intact you must be sheltered from too much information about the people who are the targets of your prejudice. The invisibility of gay people, in response to overt discrimination, perpetuates a situation in which non-gay people have little or no accurate information about lesbians and gay men, to counter stereotyped images of gays.

Clark, Elizabeth Johns; Rieker, Patricia Perri (1986). Gender Differences in Relationships and Stress of Medical and Law Students. Journal of Medical Education; Vol. 61, pp 32- 40; January 1986.

A small-scale comparative study of medical and law students was undertaken at a large, southern state university to examine the sources and consequences of stress during professional training. Specifically, the impact of stress on personal relationships was explored. Gender differences were found in the degree and source of stress perceived by the students. Women reported significantly more stress than men. Unlike the men, women found sexism and difficulties with partners to be particular sources of stress. Although both men and women reported that the stress of the professional training had resulted in strained personal relationships, proportionately more women than men stated that their personal relationships had ended.

Coalition for Gay Rights in Ontario (1986). Discrimination Against Lesbians and Gay Men; The Ontario Human Rights Commission: A Brief to the Members of the Ontario Legislature. The Coalition for Gay Rights in Ontario; October 1986.

> The range of extent of discrimination experienced by Ontario's lesbians and gay men is described, in the hope of persuading members of the legislature to include sexual orientation in the Ontario Human Rights Code. The brief explains some of the attitudes behind anti-gay discrimination and the process whereby they might be changed. Unjustifiable prejudice against lesbians and gay men is expressed in harassment, hate propaganda and even murder. Public policy in Ontario reflects and reinforces homophobic prejudice, particularly in such areas as education, family law, police/community relations and the administration of health (a matter of increasing concern in light of the AIDS crisis). Governmental complicity in anti-gay discrimination contributes to discrimination in the private sector.

Cohen, Martin A. (1985). Air Pollution Exposures To Campers Inside of Tents; A Study of the Use Of Camping Stoves and Lanterns. Air Pollution Control Association, 1985.

> The use of combustion appliances for the purpose of cooking or lighting inside camping tents has the potential of producing high indoor concentrations of combustion gases. Theses products may produce a substantial exposure to the individuals inside of the tent. This study investigates the build up of two of these products of combustion, NO_2 and CO while using a gas lantern inside of a family tent and a small gas backpacking stove inside of a backpacking tent.

Colley, J.R.T.; Brasser, L.J. (1980). Chronic Respiratory Diseases in Children in Relation to Air Pollution. World Health Organization, Regional Office for Europe, Copenhagen Denmark; 1980.

> The World Health Organization, Regional Office for Europe has organized an international collaborative study on the relationship between air pollution and respiratory diseases in children, beginning in 1971. Studies were carried out in 8 countries: Czechoslovakia, Denmark, Greece, the Netherlands, Poland, Romania, Spain and Yugoslavia. In each country areas with relatively high and low levels of air pollution were selected and investigation of groups of school children around the age of 10 was carried out. Peak expiratory flow rate (PEFR) was measured in all children and a questionnaire on respiratory symptoms was completed with the assistance of the parents. Air pollution data were obtained from existing monitoring systems in the areas concerned. The report yielded the following results: a close association exists between air pollution and various respiratory indices in children, and smoke appears to have a greater effect on health than SO_2. It is likely that initial effects on children's respiratory indices should be sought in areas with an annual mean concentration of SO_2 and smoke of 50-200 ug/m 3.

Colligan, M.J. (1981). Psychological Effects of Indoor Air Pollution. Bull. N.Y. Acad. Med., Vol. 57, No. 10, pp. 1014-1026; 1981.

Keywords: carbon monoxide; memory; pathology; anxiety; indoor air pollution;

Collishaw, Neil E.; Kirkbride, John; Wigle, Donald T. (1984). Tobacco Smoke in the Workplace: An Occupational Health Hazard. Canadian Medical Association Journal, No. 131; November 1984.

Tobacco smoke, which contains over 50 known carcinogens and many other toxic agents, is a health hazard for nonsmokers who are regularly exposed to it while at work. Involuntary exposure to tobacco annoys and irritates many healthy non-smokers. Serious acute health effects are probably limited to the one fifth of the population with pre-existing health conditions that are aggravated by exposure to tobacco smoke. The consequences of long-term exposure include decreased lung function and lung cancer. Existing air quality standards for workplaces do not directly specify an acceptable level for tobacco smoke. The evidence on the composition of tobacco smoke and on the health hazards of involuntary exposure suggests that there may not be a safe level for such exposure.

Colome, S.D.; Spengler, J.D.; McCarthy, S. (1982). Comparisons of Elements and Inorganic Compounds Inside and Outside of Residences: from Indoor Air Pollution; Spengler, John—editor. Environ. Int., Vol. 8, No. 1/6, pp. 197-212; 1982; Pergamon Press, Oxford, Toronto.

The results of more than 1 year of air monitoring inside and outside of five homes in each of two communities are presented for SO2, NO2, mass respirable particles, SO4, Al, Br, Cl, Mn, Na, and V. Outdoor measurements across the home site in each city are consistent with proximity to outdoor sources. Looking across indoor residential sites in each city, the home appears to alter outdoor concentrations in several ways. Indoor levels of SO2, SO4, Mn, and V are lower than those measured outdoors. These constituents are thought generally to result from outdoor sources. The other constituents studied are at times found in excess within homes. In some cases, the source of excess concentration of a particular constituent could be identified; often, however, the source of excess indoor concentration could not be identified.

Combs, E. Radene; Hanzal-Kashi, Amy (1985). Conversion of a Community School into Living Quarters for the Elderly. Environmental Change/Social Change; EDRA 16; pp 354; Environmental Design Research Association; 1985.

Research has shown that it is important for people to have control, security, continuity, identity and stimulation in their lives. Environmental design that enables the elderly to more adequately meet these needs can be found in a variety of housing alternatives. This paper investigates and analyzes one such alternative — the conversion of a community school building into living units for the elderly. The community is described (land use patterns, demographic characteristics, connections with the larger metropolitan area). The decision-making process used in determining the design of the individual units and of the common space is described. The results of the initial design process and the modifications that have taken place on the basis of feedback are presented. Also presented is an analysis of current residents' evaluation of their living arrangement in terms of control, security, continuity, identity and stimulation.

Committee on Indoor Pollutants, National Academy of Science (1982). Indoor Pollutants. US Govt.; NTIS PB82-180563; March 1982.

This report is intended to characterize the quality of the indoor environment—primarily with respect to airborne pollutants, although others are discussed—and to determine the potential adverse health effects of indoor pollutants. The charge was to review, compile, and appraise the available knowledge. The Committee has also identified the research needed for abatement of indoor pollution. "Indoor" refers to the environments in homes, schools, and public buildings.

Comptroller General of the U.S. (1980). Indoor Air Pollution: An Emerging Health Problem: Report to the Congress by the Comptroller General of the United States. U.S. General Accounting Office, Document Handling and Information Services Facility, Box 6015, Gaithersburg MD 20760; Sept. 24 1980.

Keywords: toxicology; air pollution; asbestos; nitrogen dioxide; radon; carbon monoxide; formaldehyde; indoor air pollution; particulates;

Consumer Federation of America (1987). Canada Sets Exposure Limit Guidelines for Indoor Pollutants. Indoor Air News, Vol III, No. 4, p. 3; Fall 1987; Exposure Guideline Report available from Communications Directorate, Health and Welfare Canada, 5th floor, Brooke Claxton Building, Ottawa, Ontario K1A 0K9.

The articles reports on the release of the April 1987 report entitled "Exposure Guidelines for Residential Indoor Air Quality", compiled by a Federal/Provincial Advisory Committee on Environmental and Occupational Health. The report outlines maximum acceptable concentrations for specified substances, in the form of 'Acceptable Long-Term Exposure Ranges' (ALTER) and 'Acceptable Short-Term Exposure Ranges' (ASTER) for nine substances or groups of substances (aldehydes, carbon dioxide, carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulphur dioxide, and water vapour). The committee found that the data base was inadequate, or human exposure limits inappropriate, for eight other contaminants. The report notes that an important consideration in deriving the acceptable exposure ranges was the possibility of interactive effects. Where possible, due account was taken of the potential for synergistic and additive effects.

Contenta, Sandro (1987). Minorities Face Racial Barriers, College Study Says. Toronto Star, page A7; December 11, 1987.

> Community colleges discriminate against ethnic minority groups by severely restricting access to the training and education they need. This study for George Brown College in Toronto indicated that there were problems with admission requirements, lack of bridging programs, failure to acknowledge skills obtained in other countries, too few courses combining learning English with studying a trade, little attempt to reach out to minority groups, lack of child-care facilities, and insensitivity of college staff and course content to cultural diversity. Immigrant groups interviewed for the study made it clear that they face similar discrimination in all community colleges.

Cooper, Cary L.; Marshall, Judi (1976). Occupational Sources of Stress; a Review of the Literature Relating to Coronary Heart Disease and Mental Ill Health. J. occup. Psychol., No. 49, pp 11 - 28; 1976.

> A great deal of research has been done linking the working conditions of a particular job and its relationship to physical and mental health. Poor mental health is directly related to unpleasant work conditions, the necessity to work fast and to expend a lot of physical effort, and to excessive and inconvenient hours. Poor physical health is linked to repetitive and dehumanizing environments such as paced assembly lines. Research in this area is desperately needed. Qualitative (too difficult) and quantitative (too much) work overload also negatively effects health, being strongly linked to cigarette smoking, coronary heart attacks, low self esteem, skin resistance, and high cholesterol levels.
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> Another major source of occupational stress is associated with a person's role at work. Role ambiguity, which exists when an individual has inadequate information about his/her work role, creates low job satisfaction, high tension, greater futility, and low self confidence and is related to increased blood pressure and pulse rate. Role conflict exists when an individual is torn by conflicting job demands or doing things he/she really does not want to do or does not think are part of the job specification. This causes physiological strain and job dissatisfaction.
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> Other major sources of stress at work involve the nature of relationships with one's boss, subordinates and colleagues, and the organizational structure and climate. The latter includes little or no participation in the decision-making process, lack of effective consultation, restrictions on behaviour, and office politics. Little work has been done into some of the more important extra-organizational factors, particularly the relationship between family and work. Stresses may arise over the allocation of time and commitment to the areas of occupational/productive and domestic/consumer activities.

Cooper, W. Clark (1973). Indicators of Susceptibility to Industrial Chemicals. Journal of Occupational Medicine, Vol. 15, No. 4, pp. 355-359; April 1973.

Individuals differ in their susceptibility to toxic agents and other environmental stresses. All individuals do not react similarly, nor do lower animals, when exposed to toxic agents. Some individuals show effects at concentrations which do not affect the majority, while at the other end of the dose-response curve there are individuals who are unusually resistant. Terms like idiosyncrasy or hypersusceptibility have been used to describe, but not explain, extreme deviations in the direction of lack of resistance.

Couchman, Robert (1986). Provider and Parent: Fatherhood Renewal as a Dynamic in the World of Work: A New Work Agenda for Canada. Canadian Mental Health Association, Toronto Canada; 1986.

The steadily increasing involvement of fathers with their children may well be the single most important positive development emerging from the familial turbulence of the past 20 years. However, the struggle to correct the imbalance in work loads between husbands and wives continues. In two recent studies, for example, it was discovered that women working full time experience a major imbalance in family and household work loads. The fatherhood revival is having a powerful influence upon the world of work. A significant number of male workers are beginning to exercise influence so as to restore the balance in their family responsibilities and parenting relationships. This results in work time flexibility, part-time work, and job sharing.

Crawford, T. (1987). There is Something About Welfare Itself That Creates Victims. Toronto Star, November 30, 1987.

The article reviews a study reported in the October 1987 issue of the Canadian Journal of Psychiatry, in which Dr. Dan Offord of McMaster University conducted a survey of child victims of welfare. The study is reported to conclude that children from families living on welfare are three times more likely than their classmates to end up flunking a grade or sent to remedial classes for slow learners. Ontario's Minister of Community and Social Services, John Sweeney, was quoted as saying in response to a question about the study, "There is something about welfare itself, the atmosphere and the environment, that creates (these problems)". The Minister is quoted as suggesting that the solution to the welfare trap must lie in programs which lead to self-sufficiency, "so they can escape the feeling that 'Someone else is running my life'".

Statistics Canada had announced a week earlier that 1 million Canadian children live in families with incomes below the poverty line. Penny Moss, former chair of the Toronto Board of Education, was also quoted

as saying at a conference on poverty and education the week before, that schools are failing the poor, citing the example that only 46 per cent of the children of the poor end up in advanced high school programs needed for university entrance, compared with 88 per cent of middle-class children.

Crawshaw, G.H. (1978). The Role of Wool Carpets in Controlling Indoor Air Pollution. Textile Institute and Industry, Vol. 16, No. 1, pp. 12-15; January 1978.

Keywords: carpet manufacture; dust abatement; air pollution; sulfur dioxide;

Cullen, Joseph; Greenwald, Peter (1986). Prevention of Cancer: from Handbook of Prevention; Edelstein, Barry A. and Michelson, Larry, editors. Plenum Press, New York, 1986; pp. 307 - 341.

Current scientific knowledge about cancer has led us to a new avenue toward disease prevention and health promotion. The way to health and a life without cancer requires changes in traditional lifestyles. Lifestyle and environmental factors cause or promote at least 70% of cancer cases. Most of these are controllable at the personal level. These include tobacco, diet, occupation, alcohol, viruses, excess sunshine, medicine and medical procedures, food additives, and environmental pollution. Clarifying this knowledge for the public and medical community and motivating them to make changes in their lifestyles and professional practices are the next advances required to make cancer prevention a probability.

Culot, Michel V.J.; Olson, Hilding G.; Schiager, Keith J. (1978). Field Applications of a Radon Barrier to Reduce Indoor Airborne Radon Progeny. Health Physics, Vol. 34, pp. 501-503; May 1978; Pergamon Press Ltd.

Keywords: radon; indoor air pollution; abatement;

Current Intelligence System staff/Div. of Criteria Documentation and Standard Development: NIOSH (1981). Formaldehyde: Evidence of Carcinogenicity. US Dept. of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; April 15 1981.

Keywords: industrial medicine; formaldehyde; carcinogens; aldehydes;

D'Arcy, Carl; Siddique, C.M. (1985). Unemployment and Health: An Analysis of "Canada Health Survey" Data. International Journal of Health Services, Volume 15, Number 4, 1985; pp 609 - 635; Baywood Publishing Co., Inc.

This paper provides a cross-sectional analysis of the physical and emotional well-being of employed and unemployed workers. The data used consists of a sub-sample drawn from the Canada Health Survey's national probability sample. The analysis indicates substantial health differences between employed and unemployed individuals. The unemployed showed significantly higher levels of distress, greater short-term and long-term disability, reported a large number of health problems, had been patients more often, and used proportionately more health services. Consistent with these measures, derived from self-reported data, physician-diagnosed measures also indicate a greater vulnerability of unemployed individuals to serious physical ailments such as heart trouble, pain in heart and chest, high blood pressure, spells of faint-dizziness, bone-joint problems and hypertension. While these health differences persisted across socio-economic and demographic conditions, females and older unemployed individuals reported more health problems and physician visits whereas people under 40 reported more psychological distress. The blue-collar unemployed were found to be considerably more vulnerable to physical illness whereas the unemployed with professional background reported more psychological distress. The low-income unemployed who were also the principal family earners were the most psychologically distressed. The need for social policies that effectively reduce unemployment and its detrimental impact is clear.

Dadd, Debra Lynn; Levin, Alan S. (1982). A Consumer Guide for the Chemically Sensitive. Nontoxic Lifestyles Inc., 450 Sutter, suite 1138, San Francisco CA 94108; 1982.

Many daily processes can cause health problems for the chemically sensitive. Commercial inks and papers, certain types of reproduction processes, as well as various types of school and art supplies can give off immunotoxic fumes and cause reactions in susceptible individuals.

Dadd, Debra Lynn (1984). NonToxic and Natural. Jeremy P. Tarcher Inc.; 1984.

Most consumers assume that if products are on the market they must be safe, but thousands of products in daily use contain chemical substances that we are now discovering may cause health problems from minor discomfort to major illness. Those who seek a healthier lifestyle can significantly reduce their exposure to these toxins by paying attention to what they buy. This book lists over 1000 products in over 300 categories which are non-toxic and naturally-based, without chemical additives. It reflects the efforts of a researcher who specializes in finding consumer products free of toxic chemicals.

Deglish, Susan (1987). How Many Suffer From Food Additive Reactions?. Allergy Quarterly, Volume 23, p 5; Summer, 1987.

> Questionnaires indicate that 15.5% of the population of Great Britain believe that they are adversely affected by food additives. Dr. Maurice Lessof, a professor at Guy's Hospital in England and a world-renowned researcher into food sensitivities, is conducting research to examine the actual incidence of reactions to food additives. He has concluded that the best way to handle a suspected reaction to a food additive is to eliminate it from the diet for a few months.

Deglish, Susan (1987). How To Reduce or Eliminate Indoor Air Pollution: Part IV of Environmental Concerns. Allergy Quarterly, Volume 23, No. 4, pp. 17-19; 1987.

> This article by the Allergy Information Association (25 Poynter Dr., Weston, Ont M9R1K8) reviews ways of reducing indoor air pollution for the allergic person, including dust control, mould avoidance, and advice on animals, tobacco smoke, heating, pesticide use, and general chemical odours in the home. It emphasizes that many indoor substances, both natural and man-made, can adversely affect the health of susceptible individuals.

Dahl, Alan R.; Hadley, William M. (1983). Formaldehyde Production Promoted by Rat Nasal Cytochrome P-450-Dependent Monooxygenases with Nasal Decongestants, Essences, Solvents, Air Pollutants, Nicotine, and Cocaine as Substrates. Toxicology and Applied Pharmacology, No. 67, pp. 200-205; 1983.

> The results of this study indicate that a variety of materials which often come in contact with the nasal mucosa can be metabolized to formaldehyde by nasal enzymes. The released formaldehyde may influence the irritancy of inhaled compounds and has been suggested to play a role in the tumorigenicity of some compounds. Thirty-two potential substrates for cytochrome P-450-dependent monooxygenases were screened with rat nasal and. for comparison, liver microsomes. Tested substrates included 6 nasal decongestants, cocaine, nicotine, 9 essences, 3 potential air pollutants, and 12 solvents.
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> Five substrates, namely, the solvents HMPA and dimethylaniline, cocaine, and the essences dimethyl anthranilate and p-methoxyacetophone, were metabolized to produce formaldehyde at rates exceeding 1000 pmol/mg microsomal protein/min. by nasal microsomes. Eight subtrates, including four nasal decongestants, nicotine, and an extract of diesel exhaust particles, were metabolized to produce formaldehyde at rates of 200 to 1000 pmol/mg microsomal protein/min. Five other substrates were metabolized to formaldehyde at detectable rates.

Dainty, E.D.; Mitchell, E.W.; Schnakenberg, G.H., Jr. (1986). Diesel Emissions Reduction. Occupational Health in Ontario, Vol. 7, No. 4, pp 170 - 191; Fall, 1986; Ontario Ministry of Labour, Occupational Health and Safety Division, Toronto ON.

> The Collaborative Diesel Research Advisory Panel was established to resolve a number of issues including: a criterion to evaluate the comprehensive toxicity of the major components of diesel exhaust, research and development to produce add-on exhaust hardware, the study of other techniques to reduce emissions from diesel engines, measurement of the impact of such devices on the underground environment and the strategy to improve mine environments, reduce ventilation costs, increase productivity and improve safety underground, depending on the circumstances of each case.

Damstra, Terri (1978). Environmental Chemicals and Nervous System Dysfunction. The Yale Journal of Biology and Medicine, No. 51, pp. 457-468; 1978.

> Subtle, subclinical effects may result from chronic low-level exposures to many chemicals. The nervous system may be particularly vulnerable to many of these exogenous chemicals. Selective damage to particular areas of the nervous system has been noted with numerous toxins, and certain groups, such as the young and the elderly, may be especially vulnerable. Selected examples of associations between nervous system diseases and exposures to occupational and environmental chemicals such as inorganic and organo-lead compounds, elemental, inorganic and organo-mercury compounds, kepone, organo-phosphates, n-hexame and methyl-n-butyl ketone, have been reviewed.

Daniell, Harry (1976). Try Not to Exhaust Yourself. Runner's World, Vol. 11, No. 9, pp. 54-55; September 1976.

> Carbon monoxide from automobile exhaust, paint and varnish removers, certain prescription medications such as Phenobarbitol and Dilantin, and cigarette smoke can negatively effect the distance runner in a number of ways. Commonly encountered carbon monoxide concentrations interfere with endurance performance for many hours after exposure to the gas has ended. Breathing air containing 50 ppm of carbon monoxide at rest causes the concentration in the bloodstream to rise to 5% in five hours. But during vigorous exercise, this level of air pollution can produce a level of 5% in less than one hour. This limits oxygen transport to muscle tissue by 5%. It is not metabolized but must be dissipated by being exhaled.

Darlington, L.G.; Ramsey, N.W.; Mansfield, J.R. (1986). Placebo-Controlled, Blind Study of Dietary Manipulation Therapy in Rheumatoid Arthritis. The Lancet; pp 236 - 238; February, 1986.

In a blind, placebo-controlled study of dietary manipulation therapy in outpatients with rheumatoid arthritis there was significant objective improvement during periods of dietary therapy compared with periods of placebo treatment, particularly among "good responders". Possible explanations for improvement include reduced food intolerance, reduced gastrointestinal permeability, and benefit from weight loss and from altered intake of substrates for prostaglandin production. A proportion of the improvement was due to a placebo response, but this was not sufficient to explain the whole improvement.

Davey, Paula G.; Shearer, Ruth W. (1986). Hypersensitivity Causes by Environmental Chemicals, in Particular Pesticides. Clinical Ecology, Vol. IV, NO. 1, Spring 1986.

There is an inadequate data base concerning many petrochemical compounds and pesticides. Chemically sensitized patients often share common symptoms which include the inability to concentrate, irritability, anxiety, recurrent flue-like symptoms, shortness of breath, gaseous distension, nausea, aching, weakness, and fatigue. The health test data is of very poor quality as studies in animals are not designed to look for this chemical sensitivity problem.

Cytotoxic tests of 100 patients' blood against two pesticides revealed cell damage of 50% of patients at the 1:10 dilution of Ficam and all patients tested had cell damage at the 1:80 dilution of Dursban. Case histories are cited.

Davidson, Marilyn J.; Cooper, Cary L.; Chamberlain, Deborah (1980). Type-A Coronary-Prone Behavior and Stress in Senior Female Managers and Administrators. Journal of Occupational Medicine, Vol. 22, No. 12, pp. 801-805; December 1980.

Davies, Freda Lynn (1988). Skipping School in Earnest: (advanced pre-publication draft). Afore-the-Wind Publishers, Hwy 595, NR608, South Gillies, Ont P0T 2V0.

The author examines the beliefs underlying educational institutions, and discusses the alternative of home-schooling in Canada. She demonstrates that conventional educational thinking is incompatible with the development of a future-oriented vision of promise. She notes that children are one of a number of groups who have suffered injustices as a result of ingrained attitudes which regard such groups as somehow inferior. Like racial and cultural minorities, like women, like those missing one or several of the "normal" human traits, children have been victims of a stereotyped characterization based on unexamined premises. Some of these other groups have begun to obtain release from their castes, and to gain recognition as individual humans. Children, as yet, are nowhere near achieving such liberation. Many older people still feel that it is acceptable, perhaps even necessary, for children to be treated in ways unacceptable for the treatment of adults: to be humiliated, insulted, judged constantly, interrogated and compelled to obey.

Davis, Karen (1985). Biochemical Individuality, Nutrition, and Learning Disabilities: Supported by a grant from the ACLD Foundation. University of Tennessee, Centre for the Health Sciences, Memphis, TN 38163.

> Learning disabilities, a heterogenous group of entities of multiple causes are, in the most basic sense, an expression of underlying central nervous system dysfunction. This shows up as specific deficits in perceptual, integrative, or expressive processes which severely impair learning efficiency. A myriad of causes has been proposed such as genetic constitution, prematurity, complications of pregnancy, labour or delivery, metabolic disorders, malnutrition, infectious disease sequelae, trauma and chronic illness. This paper concentrates on nutrition as a factor which plays a relevant role in the development of, and perhaps in the prevention of learning disabilities.

Day, David M.; Page, Steward (1986). Portrayal of Mental Illness in Canadian Newspapers. Can. J. Psychiatry, Vol. 31, December 1986; pp 813 - 817.

> Results are reported from a content analysis of 103 newspaper reports taken from eight major Canadian newspapers and selected at random from the Canadian Newspaper Index. The portrayal of mental illness and mentally ill persons in these reports was compared with that in samples of articles taken from two comparison mental health publications not receiving popular circulation. As compared with these latter publications the content analysis indicated that the newspapers portrayed mental illness and the mentally ill in a manner which could be described as essentially pejorative, thus seeming to support frequent observation and complaints from the mental health establishment about inadequate or unfair coverage of mental illness in the popular print media. Implications for the attitudes and beliefs of the general public about mental illness are offered, although the correlation between media information and the attitudes of the public remains speculative. It is suggested that further content analyses of print media be undertaken.

Day, James (1986). UFFI-Fungal Interaction. Significance of Fungi in Indoor Air, Part II, Working Papers; Health and Welfare Canada Working Group on Fungi and Indoor Air; March, 1986.

> Molds can cause a variety of ailments in humans, both allergic responses and infections. Work in the area to pinpoint the specific causitive agents is hampered by measurement problems, but in some instances a positive correlation has been established. There is an increasing effort to correlate symptoms with the indoor as well as the outdoor environment. Further research should include complete mold testing of subjects from different populations with seasonal and non-seasonal asthmatic symptoms from UFFI and non UFFI containing households; making up of new antigens from available preparations for in vitro use; identification of all molds in households with subjects complaining of multiple symptoms for

which there is no medical explanation; determination of biological effects of toxins from molds obtained from UFFI containing households; and controlled exposure over time in a specially designed chamber to appropriate mold antigens, and the measurement of end organ responses. An extensive bibliography is included.

Dean, Alfred; Lin, Nan (1977). The Stress-Buffering Role of Social support: Problems and Prospects for Systematic Investigation. The Journal of Nervous and Mental Disease; Vol 165, No. 6, pp 403 - 417.

Over the past 20 yars, a sizable body of literature has developed which serves to establish that stressful life events are associated with the onset, incidence, and prevalence of a wide range of physical and psychiatric disorders. Several prominent researchers have emphasized the importance of studying the role of social support systems as possible buffers or mediators of stress. This paper contributes to the advancement of such studies by clearly identifying key empirical, theoretical and methodological problems and suggesting some approaches to their resolution. Detailed proposals are made for approaching problems of measurement and research design. An extensive bibliography is included.

Dean, Jack H.; Ward, Edward C.; Murray, Michael J.; Lauer, Lloyd D.; House, Robert V. (1983). Immunotoxicity of Polycyclic Aromatic Hydrocarbons. NIH Immunotoxicology Workshop; pp 259 - 273; October, 1983.

Polycyclic aromatic hydrocarbons have been shown to be immunosuppressive specifically with reference to the antibody response to the T-dependent antigen SRBC. This suppression has been shown to occur within 2 days after exposure to carcinogenic PAH. Several indicators of general immunotoxicity were assessed in mice exposed to selected doses of DMBA. While pathological examination of the immune system following exposure to chemicals may give general indications of immunotoxicity, assessment of functional responses of lymphoid cells are usually more sensitive indicators of immune alteration. In the studies summarized here, mice exposed to the carcinogenic PAH CMBA, at exposure levels which produced no mortality or other obvious clinical symptoms of general toxicity, were found to have profoundly suppressed IgM antibody response to the thymus-dependent antigen SRBC. This occurence is explained and discussed in detail.

Dershewitz, Robert A.; Williamson, John W. (1977). Prevention of Childhood Household Injuries: A Controlled Clinical Trial. Am J Public Health, Vol. 67, No. 2, pp 1148 - 1153; 1977.

Injuries claim the lives of more children each year than the next six leading pediatric disorders combined, and produce injuries that require medical attention for one in three children. In the preschool age group, 91 percent of these accidents and over one-half the resultant fatalities occur in the home. This paper reports the results of a controlled clinical trial conducted to evaluate the implementation of a health education program intended to reduce the risk of childhood household injuries. The study population was randomly assigned into two demographically comparable groups. Only the experimental group mothers received an educational intervention consisting of a tutorial, home safety-proofing assignments, and follow-up. The homes of the two groups were later assessed for hazards during an unannounced visit by an interviewer who did not know to which group each home belonged. A home safety score mean for the two groups was almost identical. The program stimulated heightened interest and stated intent to improve, but did not result in actual reduction of household hazards. Active health education, as used and evaluated in this study, appears to have limited effectiveness when applied to home safety.

Diamond, Philip (1970). Health Hazard Potential from Pre-Polymerized Foam Packaging Materials: Final Report. US Govt.; January 1970.

Keywords: plastics; packing materials; isocyanic acid; industrial medicine; polymerization; indoor air pollution; confined environments;

Dickey, Lawrence D. (1976). Clinical Ecology. Charles C. Thomas, Springfield IL; 1976.

This author is concerned with adverse reactions to environmental insults modified by individual susceptibility in terms of specific adaptation. The outcome of the interreaction of excitants versus host is modified by the host's individual susceptibility which is governed by genetic background, present state of physical and mental well-being, and the individual's ability to adapt. Chemical contaminants, pesticides, herbicides, additives, vehicles, and excipients that are to be found in the air, water, food, drugs and our habitat are dealt with in this publication, with specific reference to diagnostic and therapeutic procedures, avoidance procedures, and detailed explanations of the susceptibility mechanism.

Didriksen, Nancy; Goven, Arthur; Butler, Joel R. (1986). Psychological Stress: Effects on Phagocytic Immune Functioning. Clinical Ecology, Vol. IV, No. 1, Spring 1986.

The purpose of this study was to determine whether psychological stress, specifically examination stress, would decrease immune system functioning. Subjects were 25 first-year master's and doctoral students. They were psychologically and immunologically assessed during two high- and two low-stress periods. Immunological assessments includes a white blood cell differential count and nitroblue tetrazolium test (NBT) to measure neutrophil functioning. Psychological instruments administered at each assessment period included Clinical Analysis Questionnaire, State-Trait

Anxiety Inventory, and a Brief Stress Questionnaire. Stepwise discriminant function analsyis of data revealed five variables which contributed significantly to change under stress with the NBT test being the most significant. These variables yielded an average canonical correlation of .79 (p less than .002) providing evidence of support for the hypothesis that increased psychological stress will alter immune functioning and heighten psychological responses.

Didriksen, Nancy A. (1987). Psychological Stress: Effect on Humoral Immune Functioning As Measured by Immunoglobulin Levels: Abstracts. Symposium on Man and His Environment in Health and Disease; 1987.

23 volunteers were subjected to a series of psychological tests to measure stress, personality factors, emotional states and anxiety levels. Results showed increased immunoglobulin levels during periods of stress; anxiety related to external events; increase in anxiety under stress; and anxiety inversely correlated with emotional stability and coping skills while positively related to tension, increased number of somatic complaints, and obsessive-compulsive trends. It was concluded that the concept of body/mind interaction was the most realistic approach to understanding the total response patterns.

Dillon, Carolyn (1985). Families, Transitions, and Health: Another Look. Social work in Health Care; Vol. 10, No. 4, pp 35 - 44; Summer 1985.

The fate of humane, family-centered health care may well rest on the ability of caregivers to identify and empathically respond to complex family-like forces arising when large numbers of desperate people converge to interact around issues of health and illness, life and death, competence and vulnerability. The health social worker is in a position to observe how the illness family and the caregiving professionals meet in moments of crisis and stress, sometimes responding to and assessing each other in regressive ways. The social worker can also play a major facilitating role in negotiating between these two groups, building consensus for positive collaboration.

Dimmick, R.L.; Wolochow, H. (1980). Effects of Energy Conservation Measures on Air Hygiene in Public Buildings: Final Report. University of California; Lawrence Berkeley Laboratory, Energy and Environment Division, Berkeley CA; February 1980.

Keywords: hospitals; schools; aerosols; bacteria; indoor air pollution; public buildings; ventilation systems;

Dockery, Douglas W.; Spengler, John D. (1981). Indoor-Outdoor Relationships of Respirable Sulfates and Particles. Atmospheric Environment, Vol. 15, No. 3, pp. 335-344; 1981; Pergamon Press Ltd.

Keywords: cigarette smoking; gas stove; air conditioning; sulphates;

Dodge, Russell (1982). The Effects of Indoor Pollution on Arizona Children. Archives of Environmental Health, Vol. 37, No. 3, p. 151; May/June 1982.

> The respiratory health of a large group of Arizona school children who have been exposed to indoor pollutants—tobacco smoke and home cooking fumes—is reported. A significant relationship was found between parental smoking and symptoms of cough, wheeze, and sputum production. Also, children in homes where gas cooking fuel was used had higher rates of cough than children in homes where electricity was used. No differences in pulmonary function or yearly lung growth rates occurred among subjects grouped by exposure to tobacco smoke or cooking fuel. Thus, parental smoking and home cooking fuel affected cross-sectional respiratory symptom rates in a large group of Arizona school children. Study of pulmonary function, however, revealed no lung function or lung growth effects during 4 years of study.

Dohrenwend, Bruce; Pearlin, Leonard; Clayton, Paula; Hamburg, Betty; Riley, Matilda; Rose, Robert M. (1983). Report on Stress and Life Events: Analysis and Implications of Research/A Study by the Institute of Medicine, National Academy of Sciences. Stress and Human Health; chapter 4, pp 55 - 80; Elliott, Glen R.; Eisdorfer, Carl ed; Springer Publishing Company, New York; 1983.

> Substantial changes in future studies of life events and health are needed. Linkages between life events and health are influenced by many mediators: social characteristics, position along the life course, personality traits and coping repertoires, and the supportiveness of social networks. To provide a clearer view of the many elements that affect the stress process, studies should be as inclusive as possible. Thus a study of associations between life events and disease consequences could be improved if it also considered the effects of social supports and potentially relevant personality characteristics. A comprehensive bibliography is included.

Douglas, Carolyn J.; Kalman, Concetta M.; Kalman, Thomas P. (1985). Homophobia Among Physicians and Nurses: An Empirical Study. Hospital and Community Psychiatry, Vol. 36, No. 12, pp. 1309-1311; December 1985.

> The authors note that the current epidemic of acquired immune deficiency syndrome (AIDS) has had a great impact on public attitudes toward homosexuals, leading to many instances of overt discrimination, social ostracism, and even the deprivation of various rights such as housing, employment, transportation, and funeral services. The study attempted to determine the degree of homophobia among physicians and nurses working in a large urban teaching hospital where many male homosexuals with AIDS have been treated. The investigators defined homophobia as the constellation of affective responses, including fear, disgust, anger, discomfort, and aversion, that many individuals may experience in contact with homosexuals.

Mean scores for both physicians and nurses fell in the low-grade homophobic range. Greater homophobia was found among female respondents, compared to males. Having a close relative or friend who is gay significantly reduced personal anxiety about homosexuals. The results indicated that a disturbingly high percentage (31%) of the health professionals studied acknowledge more negative, even overtly hostile feelings toward homosexuals than they had before the emergence of the AIDS epidemic. The authors speculate that health professionals may be more aware than the general population that most homosexuals do not fit stereotypes of homosexuality. While increased contact with homosexuals may serve to dispel false stereotypes and lessen homophobia in some individuals, they suggest that it may heighten anxiety and elicit greater hostility in others, if those stereotypes served important defensive functions.

Drader, Darla (1982). The Design of Geriatric Assessment Units: Psychosocial Considerations: Final Report. Health and Welfare Canada; September, 1982.

This report reviews literature concerning the design-related needs of the elderly in acute care settings. Design for the elderly should be based on an understanding of their special needs because they are less able to adapt to environments and have more difficulty coping with stress. Environments should enhance their adaptive capacity by providing a range of behavioural alternatives in a flexibly designed setting. Since place and possessions have a special significance for the elderly, design should also allow for a sense of continuity with the past as well as for privacy. Physical changes that accompany aging, such as hearing losses, visual changes, reductions in motor skill, changes in memory and learning, and diseases, should also be considered in design. An extensive reference list is included.

Dravnieks, A.; Whitfield, J. (1971). Gas Chromatographic Study of Air Quality in Schools. ASHRAE Trans, Vol. 77, Pt. 1, pp 113-123; 1971.

By use of high-capacity organic vapor collection devices and appropriate sample transfer analysis techniques, combined with psychophysical (sensory) odor evaluation of the gas chromatographically resolved components at the effluent port of a gas chromatograph, it is possible to gather considerable insight into the inventory of the odorous components of an air sample. These procedures were applied to a study of air in several Chicago metropolitan area schools. The outside air was also examined, to permit assessments of the contribution of outside air pollution to the air pollution of the school air by organic vapors and odorants. The gas chromatographic parameters were then inspected, using non-parametric statistics for correlations to the air quality which was first independently ranked using engineering data and on-the-spot observations.

Dudney, C.S.; Walsh, P.J. (1981). Report of Ad Hoc Task Force on Indoor Air Pollution. US Govt.; NTIS ORNL/TM-7679; April 1981.

> This Ad Hoc Task Force on Indoor Pollution has reviewed information on indoor air pollution and the potential impact on human health of energy conservation measures. The Task Force concluded that: the indoor environment is likely to include exposure to radon daughter nuclides, formaldehyde, carbon monoxide, nitrogen dioxide, respirable particulates and asbestos, as well as other undefined pollutants; indoor exposure may constitute 80-95% of the total exposure for some pollutants; some energy conservation measures reduce the rate of exchange between indoor and outdoor air; reduced air exchange can lead to increased indoor levels of some pollutants; increased indoor pollutant levels lead to increased exposure and increased risk of health impact.

Duhl, Leonard J. (1969). Health — 2000 A.D. American Journal of Public Health, Vol. 59, No. 10, pp 1809 - 1815; October, 1969.

> A broadly-based health system is envisioned with increased choices for the consumer who will increasingly control the marketplace of health as well as the regulatory apparatus. New infrastructures are needed so that the health care system can become a person-oriented one which deals with human needs.

Duhl, Leonard J. (1976). The Promotion and Maintenance of Health: Myth and Reality. Health Promotion Through Designed Environments, pp 27 - 64; Health and Welfare Canada, Health Programs Branch; October, 1976.

> In order to effect positive change in the area of physical and social environment and its relationship to health, there must be a new way of conceptualizing the development of new images, and possibly the changing of an institution's constituency. In order to promote the most effective policy-making possible, there should be a meaningful dialogue between those affected by decisions and those making them. A proposal is made for the requirement of Health Impact Statements for every proposed project within and outside the health field to see how it would affect the health of people.

Duhl, Leonard J. (1984). The Promotion and Maintenance of Health: Myth and Reality: Working Paper No. 436. Institute of Urban and Regional Development, University of California, Berkeley CA; November 1984.

> The environment is a tool for dealing with the concerns of human beings because human development — people's lives and relationships — are the cornerstones of life. Through policies and actions, we should attempt to maximize the potential of the individual for aliveness, for development, and for quality of life. The processes of healing involve not only the

individual, but the community, tribe, and family as part of the larger social and physical environment. Though we have a responsibility for optimizing the development of individuals toward attaining their health, we have an equal one to look at the healthy development of the environment.

Duhl, Leonard J. (1984). The Healthy City: Working Paper No. 435. Institute of Urban and Regional Development, University of California, Berkeley CA; November 984.

A healthy city must be a competent one for all its members. Its responses to its developmental needs, its organizations, and its people must be appropriate and effective and it must have the ability to cope with breakdowns of the system and its members. Solutions must come from the grass roots level, and must deal with the underlying issues, not the symptoms.

Dunlop, Marilyn (1987). Soil, Plant Fungi Infecting Humans U.S. Doctors Say: What's New in Medicine. Toronto Star, January 17, 1987.

Types of fungus that once only affected foods such as tomatoes and peaches are turning up as the cause of some diseases, according to Dr. John Rippon, professor of medicine at the University of Chicago. A report in Medical World News is described which detailed the finding of tomato rot fungus in 24 patients and cases of patients infected with about 100 different soil and plant fungi. According to Rippon, the new fungal infections are caused by the increase of people whose immune systems have been suppressed by drugs.

Durlak, Elizabeth (1987). Personal Interview, Elizabeth Durlak, Toronto, Ontario. Telephone contacts, November 19th and November 30th, 1987.

The author speaks as a person who happens to be asthmatic and highly sensitive to inhaled gaseous and particulate pollution. Her illness has been life-threatening, and her inability to work has left her without sufficient indepedence to arrange all the environmental conditions necessary for survival without heavy dependence on anti-asthmatic medication. She cautions that there are environmental crises in every aspect of our lives, and that the home is no exception to this: much of available housing is dangerous for environmentally susceptible individuals.

She also suggests that one reason that the needs of the handicapped and the elderly have received inadequate attention is the fact that their stories are commonly deleted from public attention, and many able-bodied people are not at all familiar with what life is like for handicapped or elderly individuals, let alone conscious of them as complex human beings of value in their own right. She notes that most handicapped people are

in fact expert problem-solvers, and that they often spend a great deal of their time and effort addressing their own environmental needs.

She also stresses that it is a fallacy to think that a disability or impairment is necessarily stable, or that a handicapped person cannot get more hurt. People who are not able-bodied must diligently avoid environmental hazards that could worsen their disability (e.g. wheelchair accidents on ramps or curbs, slips and falls for the elderly, chemical exposures for asthmatics or other chemically sensitive individuals, etc.) They are also faced with the burden of educating able-bodied people as to what conditions may be hazardous for them, that present fewer risks to the able-bodied, and they commonly encounter misunderstanding on the part of able-bodied people as to the extent of danger presented by seemingly minor hazards.

Edelstein, Barry A.; Michelson, Larry, editors (1986). Handbook of Prevention. Plenum Press, New York, 1986.

A collection of essays about preventive behavior. Includes comprehensive bibliographies in all subject areas.

Edwards, D.D. (1987). ELF Under Suspicion in New Report. Science News, Vol. 132, July 18, 1987; p. 39.

This article reviews a newly released report on a five-year research program funded by the New York State Power Lines Project. The program included 16 studies of possible health effects from 60 Hz electric and magnetic fields.

The research included an epidemiological study performed in the Denver Area by Dr. David A. Savitz of the University of North Carolina (Chapel Hill). Savitz and his co-workers concluded that the cancer risk among children in higher-exposure homes is 1.7 times greater than that among children in lower-exposure homes, and that the chances of developing leukemia in particular are 2.1 times greater.

David O. Carpenter of the State University of New York at Albany reported that there are some learning and neurological effects from extremely low frequency (ELF) electromagnetic field exposure. Pregnant rats exposed to ELF fields for 30 days developed temporary learning problems. Their offspring, exposed both in the womb and for nine days after birth, developed permanent learning deficits.

The study did not prove a definite cause-and-effect relationship between the extremely low-frequency (ELF) fields studied and the biological and behavioural effects observed.

Ehrlich, Richard (1966). Effect of Nitrogen Dioxide on Resistance to Respiratory Infection. Bacteriological Reviews, Vol. 30, No. 3, Sept. 1966, p. 604-614.

The effects of exposure to nitrogen dioxide on man and on animals are confined almost exclusively to the respiratory tract. With increasing dosage, the progressive effects of this gas are: odor perception, nasal irritation, difficulty in breathing, acute respiratory irritation, edema and death. Experimental and epidemiological data pertaining to nitrogen dioxide effects in man are sparse, especially in the low concentration level found in community air pollution.

The work reported in this paper suggests a more sensitive indicator of biological effects of nitrogen dioxide, namely, a synergistic effect or secondary effect, demonstrated by reduction in resistance to infection. A single 2-hr. exposure of Swiss albino Webster strain mice or of inbred mice to 3.5 ppm of nitrogen dioxide before or after respiratory challenge with aerosol of K. pneumoniae significantly increased mortality. Continuous exposures to 0.5 ppm for 3 months or longer as well as intermittent daily exposures over a 30-day period produced the same effect in mice. The author cautions that extrapolation to humans is speculative only.

Ehrlich, Richard; Findlay, J.C.; Fenters, J.D.; Gardner, D.E. (1977). Health Effects of Short-term Inhalation of Nitrogen Dioxide and Ozone Mixtures. Environmental Research; No. 14, pp. 223-231; 1977.

The effects of single and multiple daily 3-hour exposures to nitrogen dioxide (1.5 to 5.0 ppm) and ozone (.05 to .5 ppm) mixtures on the resistance to streptococcal pneumonia were investigated. It is suggested that a synergistic effect might be present upon repeated inhalation of pollutant mixtures, that made them more effective in reducing resistance to respiratory infection.

Eisenbud, Merril (1978). Environment, Technology, and Health: Human Ecology in Historical Perspective. New York University Press; 1978.

Various sources of environmental pollution which create toxic substances are dealt with in the framework of environmental toxicology: the manner in which they reach man after passing through intricate ecological pathways, and their biological effects on human health. Substances covered include pharmaceuticals, food additives, pesticides, dyes, detergents, soaps, atmospheric and liquid wastes from industrial processes, ionizing radiation, microwaves, combustion byproducts from automobiles, and agricultural chemicals. Nuclear power is written about in detail. Many people are influenced by the psychological association between nuclear power and nuclear weapons, while others are concerned about the gaseous

and liquid radioactive wastes discharged during normal operation, the potential dangers from the radioactive clouds that could escape in the event of a nuclear accident, the difficulty of disposing of radioactive waste, the toxicity of plutonium, or the possibility that plutonium might be diverted clandestinely into nuclear weapon production.

Social and behavioral factors have not been sufficiently emphasized in the contemporary environmental movement. Neither have the environmental problems of the impoverished attracted sufficient attention.

Elinson, Lynn (1984). Analysis of Health Status in the Neighbouring Areas of the Junction Triangle. City of Toronto Dept. of Public Health; September 1984.

This study resulted from the results of a study by Dr. Walter O. Spitzer, entitled "A Study of the Health Status of Residents of the Junction Triangle, Toronto", in which health status was examined in the city's highly industrialized Junction Triangle, a comparison census tract and in the census tracts adjacent to the Junction Triangle. For certain health status indicators it appeared that these indicators occurred more often or at higher levels in the adjacent areas compared to either the Triangle or comparison areas, while the Spitzer report only made statistical comparisons between the two latter tracts. The Spitzer data concerning this adjacent area was therefore re-examined and compared statistically with the comparison census tract data and the conclusion that there is not a major health problem in the area was cautiously drawn.

Elliott, Glen R.; Eisdorfer, Carl (1983). Stress and Human Health: Analysis and Implications of Research/A Study by the Institute of Medicine, National Academy of Sciences. Springer Publishing Company, New York; 1983.

There is marked individuality in response to stressful experiences. Both genetic and environmental factors pertinent to such individuality of response are beginning to be clarified and require more study in the future. There is a great need for genetic studies to be integrated with studies of environmentally caused variation in responses to stress. The extent of community disintegration, a lack of social supports, and the number of stressful events in the life of an individual have been found to affect illness, productivity, and life expectancy. Individuals who experience any of a wide range of stressful events or situations are at increased risk of developing a physical or mental disorder. How individuals attempt to cope with stress has been a neglected area of great potential importance. A deeper understanding of coping behaviour can be useful in devising reasonable therapeutic and preventive interventions. The promise is clearest with respect to mental health; but such interventions also have direct relevance to general health, because health-damaging coping efforts such as smoking, alcohol use, and risky driving weigh heavily in the burden of illness.

Elwood, J.M.; Williamson, C.; Stapleton, P.J. (1986). Malignant Melanoma in Relation to Moles, Pigmentation, and Exposure to Fluorescent and Other Lighting Sources. Br. J. Cancer, No. 53; pp 65 - 74; 1986.

> Interviews were performed on 83 patients with malignant melanoma and on age and sex matched controls from the same hospitals. Significantly increased risks of melanoma were found in subjects with 3 or more raised moles on the upper arms, in association with heavy freckling of the face and arms, and with a tendency to sunburn easily and tan poorly, these factors having independent effects. While no significant and consistent association with exposure to fluorescent light was seen, the observed risks were higher in subjects with greater exposure, and higher in association with exposure to undiffused than to diffused light. Cases had a significantly greater number of hours' exposure to undiffused light than did controls. The associations with fluorescent light exposure were stronger when based on interview data than on a subsequent postal questionnaire. 21 cases and 11 controls reported exposure to unusual occupational lighting sources which may have had an ultraviolet component; these included various intense lighting sources and lamps used in printing and dyeline copying.

Engen, T. (1986). Odors and Sensory Irritants: Effects on Health and Comfort. Indoor Air, Vol. 6, 1986; Swedish Council for Building Research, Stockholm Sweden; Berglund, B.; Berglund, U.; Lindvall, T.; Sundell, J.; editors.

> The study of sensations of odour and irritation has been a part of the study of indoor air from the beginning. These sensations are the effects experienced by people due to stimulation of the olfactory and trigeminal nerves — perhaps the first warning signal a person receives that the atmosphere is contaminated. While things such as body odour and tobacco smoke are still topics of research, there is now perhaps even greater concern with the odour of new building materials and related sensory effects associated with modern tight buildings. The human being is an analyzer of indoor air who makes a crucial contribution to the scientific and technological analysis of indoor air. It must be recognized that while scientific and objective measurement of the environment seem generally favoured over potentially subjective information received from the people living in the environment, it is the effect on them as they experience it which provides much of the norms for indoor air research.

English, Kathy (1987). No One Should Have To Live Like This. Toronto Star, June 7, 1987.

> A single mother with an employment income of $800 a month pays almost half of her income to live, with her two teenaged sons, in a tiny, poorly maintained, second-floor, one-bedroom apartment in Toronto. She recently broke some ribs falling down a steep staircase that has no protective

rails and one son's asthma is aggravated by poor ventilation. The basic services like heat and plumbing are inadequate. While municipal officials are aware of this and many similar rental properties, they fear pressuring landlords too hard in case scarce accomodation will be taken off the market. The tenant has been waiting more than a year for subsidized housing, but is relatively low on the priority points system that ranks the 6,000 families now on the waiting list and feels that she would be in a better situation if still on welfare assistance.

Epstein, S.S.; Grundy, R.D. (1974). Radiation Exposures from Electronic Products. from Consumer Health and Product Standards—Chemicals, Electronic Products, Radiation; MIT Press, 1974; pp. 218-221.

Ettema, J.H.; Zielhuis, R.L. (1975). Effects of Alcohol, Carbon Monoxide and Trichloroethylene Exposure on Mental Capacity. Int. Arch. Occup. Environ. Hlth., 35, pp 117-132.

Groups of adult male volunteers were exposed to alcohol, carbon monoxide or trichloroethylene. performance in mental loading tests and effects on physiological parameters were studied. Using alcohol as reference substance, producing marked effects at blood alcohol levels greater than 0.3g/1, the effects from carbon monoxide and of trichloroethylene in dosages as encountered in social and occupational life proved to be much less severe. The experiments suggest the possibility of hazardous impairment of performance in older subjects, particularly in cases of combined exposure to various external loads.

Evans, John R. et al (1987). Toward a Shared Direction for Health in Ontario. Ontario Health Review Panel, June 1987.

This is the report of a panel appointed in November 1986 by the Premier of Ontario to review the health status of the province's residents and its health care system. The panel's membership included representatives of various areas of Ontario, health care providers, consumer organizations, and researchers. The review was undertaken within a framework of a broad concept of health which goes far beyond the absence of illness and disease. Seven values were identified as benchmarks for assessing health and health care: equity, quality, comprehensiveness, informed choice, accountability, cost-effectiveness, and commitment to the future.

Although Ontario has a high standard of health and a good health care system, there are pressures for change, created by rising public expectations for health care, constraints on public resources and frustration of health providers caught in the middle. There is a need to place greater emphasis on primary care, to integrate and coordinate services, to achieve a community focus for health, and to increase the emphasis on health promotion and disease prevention. Well-founded recommendations made by credible groups over a period of fifteen years have rarely been translated into action. Three general issues have been selected which might provide an overall context in which specific problems might be addressed: strengthening the role of the individual, linking the elements of health care delivery, and increasing the emphasis on ambulatory and community-based care. It is recommended that a Premier's Council on Health Strategy be established with membership from cabinet ministers, health care providers and residents.

Farber, Michael (1987). Police Racism Has Deep Roots. The Gazette, Montreal PQ, p A - 3; August 10, 1987.

Despite efforts by the Montreal Police Director to improve race relations there is an uneasy truce between the police and minority groups. Six civil suits have been filed against Montreal Urban Community police this year for alleged racism, brutality and false arrest. A police force merely represents the society it is sworn to protect and does not have a corner on racism. But the columnist suggests that the problem is not so much racism as ignorance of what might constitute a slight, hardly shocking, he says, considering the historically closed nature of French-speaking Quebec.

Faust, Halley S.; Brilliant, Lawrence B. (1981). Is the Diagnosis of "Mass Hysteria" an Excuse for Incomplete Investigation of Low-Level Environmental Contamination?. Journal of Occupational Medicine, Vol.23, No. 1, pp. 22-26; January 1981.

Fein, Greta G.; Schwartz, Pamela M.; Jacobson, Sandra W.; Jacobson, Joseph L. (1983). Environmental Toxins and Behavioral Development: A New Role for Psychological Research. American Psychologist, Vol. 38, No. 11, pp. 1188-1197; November 1983; American Psychological Assoc., Inc.

Childhood exposure to chemicals routinely encountered in the environment has become an issue of scientific and public concern. Recent research has revealed the inadequacy of traditional notions in which chemically induced illness was likened to overt biological disease. The new multiple-effects model emphasizes subtle behavioral alteration as an early sign of toxicity and as evidence that a particular chemical agent may produce long-term impairment in susceptible individuals. For instance, a case is cited where a group of children who had been hospitalized for overt lead poisoning were evaluated using psychometric tests. Of the 19 children for whom IQ scores were available, 17 scored better than 80. This rather mild retardation was typically accompanied by emotional lability, difficulty in concentrating, and poor school performance. Of the six children whose IQ scores ranged from 95 to 106, only one did well in school. The permeability of the placenta to a variety of chemical agents and the special sensitivity of the fetus to some of these agents draws attention to prenatal exposure and the need for prospective longitudinal studies of affective, social, and cognitive development in exposed individuals. Chemicals discussed in this paper are lead, methylmercury and PCBs.

Ferguson, Roy (undated). The Hospital as a Therapeutic Environment. Alberta Children's Hospital.

> The physical environment of a hospital should be considered an important part of the patient's treatment. Hospitalization is often a frightening and stressful experience to children. The unfamiliar environment can induce stress; the child may feel insignificant, anonymous, overpowered, isolated, and intimidated by the scale and procedures of the hospital. The provision of familiar environmental cues through attempts to make certain areas of hospitals more home-like can help. And to the young child in particular, play may be instrumental in enabling hospitalization to be a positive experience. For this reason, the recreational areas and play facilities are important to a children's hospital and should be well staffed. For adolescents, greater opportunity to exercise choice and control in the physical environment will most likely result in less time spent resisting authority. Design also needs to take into consideration the need for family participation in the child's hospital stay.

Ferris, B.G. Jr.; Speizer, F.E.; Bishop, Y.M.M.; Spengler, J.D. (1979). Effects of Indoor Environment on Pulmonary Function of Children 6-9 Years Old. American Review of Respiratory Disease, No. 119 (4 pt 2), p. 214; 1979.

> A study was conducted into the type of fuel used for cooking in the home. Indoor levels of mass respirable particulate (MRP), sulfur dioxide (SO2) and nitrogen dioxide (NO2) were monitored in homes using different cooking fuels. Results of pulmonary function in the various cities in 6 to 9 years olds were analyzed. It was found that the pulmonary function is lower in those children who live in homes where gas is used for cooking as compared with electricity. Households with no air conditioning tended to have children with lower levels of pulmonary function than those households with partial or central air conditioning. These findings suggest that models taking into account effects of air pollution should include the characteristics of the indoor environment.

Ferris, B., Jr. (1986). Epidemiological Studies of Health Disorders Related to Housing. Indoor Air, Vol. 6, 1986; Swedish Council for Building Research, Stockholm Sweden; Berglund, B.; Berglund, U.; Lindvall, T.; Sundell, J.; editors.

> Epidemiology has come of age and should prove to be a useful tool in future evaluations of the effects of indoor pollutants on health. It is essential to institute quality control procedures for both air monitoring data and health data. There is a need for well-designed and carefully executed epidemiologic studies; for direct measurements of exposure of populations; to develop better estimates of dose to develop dose-response relationships; to control for confounding factors such as active or passive cigarette smoking, other pollutants, temperature, season, etc.; and for longitudinal studies to answer more precisely the medical significance of small changes.

Feuerstein, Michael; Sult, Susan; Houle, Manon (1985). Environmental Stressors and Chronic Low Back Pain: Life Events, Family and Work Environment. Pain, No. 22, pp 295 - 307; Elsevier Science Publishers; 1985.

> Stressors in the family and job environments have been proposed to play a role in the modulation of pain, yet direct empirical support for such a role is limited. This study investigated the relationship between general stress, family and work environments, psychological distress, and pain experience in 33 ambulatory chronic low back pain subjects and 35 healthy controls matched for sex, age, socioeconomic status, weight, and height. Results indicated that environmental stressors, including family conflict, family control, and general stress, were greater in the group with chronic low back pain. Increased family conflict was associated with increased distress and increased pain, while increased family independence was correlated with less distress and increased pain. Less peer cohesion, less physical comfort, and less job clarity were correlated with increased pain, but not distress. Work pressure was associated with decreased depression and less pain. These findings suggested the presence of both stress and operant mechanisms in the modulation of pain in the family, while operant and distraction mechanisms appear to characterize the relationship among work environment factors and pain.

Ficner, C.A.; Riley, M.; Lubun, M. (1985). Improving Indoor Air Quality Through Energy Conservation Programs. Air Pollution Control Association, 1985.

> This paper outlines the approach being taken by the Department of Energy, Mines and Resources to ensure that conservation measures do not adversely affect air quality. The view is presented that it is important to focus on developing means which will ensure that accepted good practices can easily be put into effect in the field. A case is made that conventional housing units do not consistently comply with accepted ventilation practice. In larger buildings, ventilation systems frequently do not perform in the way in which they were intended. Thus, the air quality question affects all buildings, whether or not they are energy efficient. It is suggested that we must emphasize the development of techniques for allowing the industry to construct, modify and operate buildings in a way which complies with existing standards.

Finberg, Laurence (1974). Interaction of the Chemical Environment with the Infant and Young Child. Pediatrics, Vol. 53, No. 5, Part II, pp. 831-836; May 1974.

> Chemical products and by-products of our society have special implications for infants and children, because maturation and growth processes are often qualitatively or quantitatively different from mature systems and because the infant and child have different environments from adults. In turn the effects may be immediate or delayed, and they may have pro-

found effects on the organism at different points in life. Finally, it would appear advisable to encourage both close epidemiologic surveillance and careful research on the effects of known pollutants. In particular, the tools of modern cell biology and molecular biology may have useful application to these problems.

Finkel, A.S.; and Duel, W.C. editors (1976). Clinical Implications of Air Pollution Research. Publishing Sciences Group, Inc., Acton, MA, USA; McAinsh & Company, Ltd., 1835 Yonge Street, Toronto Canada M4S 1L6..

This proceedings document describes the state-of-the-art at the time of the conference on the relationship between air pollution and cardiovascular and respiratory illnesses. Highlights include a number of chapters on carbon monoxide and cardiac performance (Ch. 9, Edward Haak, Ch. 10, D.A. DeBias), effects on immune defenses and asthma (Ch. 12, G.M. Green), and clinical implications of air pollution research for hypersensitivity diseases (Ch. 15, R.E. Smith). Chapter 16 (R.I. Henkin) discusses the effects of vapour phase pollutants on nervous system and sensory functions.

Finkel, Joe M.; James, Ruby H.; Miller, Herbert C. (1979). Residual Monomers in Acrylic and Modacrylic Fibers and Fabrics: Final Report. US Govt.; July 1979.

Keywords: acrylic resins; textile industry; acrylonitrile; vinylidene chloride resins; monomers; indoor air pollution;

Finn, Peter; McNeil, Taylor (1987). The Response of the Criminal Justice System to Bias Crime: An Exploratory Review. National Institute of Justice, U.S.; October 7, 1987.

This U.S. federally commissioned report, was prepared by Abt Associates for the U.S. National Institute of Justice (a division of the Department of Justice). The study deals with bias crimes against minority groups, and the response of the criminal justice system. The authors conclude that homosexuals are probably the most frequent victims of hate-motivated violence, and are targeted for assault, verbal intimidation, and vandalism more often than blacks, Hispanics, Southeast Asians, and Jews.

Finn, Ronald (1986). Environmental Medicine and the New Allergy. Clinical Ecology, Vol. IV, No. 1, Spring 1986.

Although there are many thousands of diseases, they must all be due to one of three causes — genetic, degenerative, or environmental. Environmental disease is of major clinical importance because genetic degenerative diseases have limited treatment possibilities, whereas removal of an environmental factor which is causing a disease will halt the progress of a disease or even prevent it from occuring.

A wider view of allergy is now gaining acceptance. Reactions are not limited to IgE and can be mediated by other immunoglobulins, and clinical sensitivities can also be caused by non-immunological mechanisms. The clinical spectrum of conditions in which environmental factors are of clinical importance is being expanded. Clinical observations and controlled studies are appearing which confirm that environmental control is of value in the management of many diseases.

Fischer, Claude S.; Baldassare, Mark; Ofshe, Richard J. (1975). Crowding Studies and Urban Life: A Critical Review. Journal of the American Institute of Planners, No. 41, pp 406 - 418; November, 1975.

The crowding literature is reviewed with particular concern for its implications for urban life. It was found that much of the research is methodologically or conceptually limited, and that density, though perceived as unpleasant, does not appear to have definite and consistent detrimental effects. Several theoretical frameworks for guiding future research on the effects of urban density are presented. A comprehensive bibliography is included.

Fischer, Claude S. (1982). What Do We Mean by 'Friend'? An Inductive Study. Social Network, No. 3, pp 287 - 306; 1982.

The study of friendship is a popular and important one to the study of how social support networks influence health and stress coping mechanisms. However, the concept of 'friend' is ambiguous. This study was undertaken in order to determine what aspects of real relations are correlated with applications of the label 'friend'. In a survey of 1050 adults, the authors obtained the names and descriptions of 19,417 associates. Of these, 59% were labelled 'friends'. Several regression analyses suggest that this label is likely to be applied: to an overwhelming majority of non-relatives in a largely unsystematic way; to associates lacking other, specialized role-relations; to people of the same age; to people known a long time; and to people with whom respondents had primarily sociable, rather than intimate or material, involvements.

Fischer, Claude (1982). To Dwell Among Friends: Personal Networks in Town and City. University of Chicago Press; 1982.

Modern urban life has destroyed community and caused it to disintegrate into a mass of atomistic and alienated individuals. This is a study of personal networks in city and small town environments. All else held constant, respondents with below-average household incomes who lived in semirural communities tended to have more local nonkin associates, bound up in denser networks, than did low-income respondents residing in other places. The semirural people tended also to report a slightly more positive sense of well-being than their counterparts elsewhere. This is a thread that ought to be followed in future research. A comprehensive bibliography is included.

Fishbeck, William A.; Townsend, Jean C.; Swank, Marlene G. (1978). Effects of Chronic Occupational Exposure to Measured Concentrations of Benzene. Journal of Occupational Medicine, Vol. 20, No. 8, pp. 539-542; 1978.

Fisher, Alexander A. (1983). Paper Dermatitis: Current Contact News. CUTIS. Vol. 31, pp. 392-405; April 1983.

> Various types of chemicals are found in different papers. Formaldehyde, ammonia, hydrogen sulfide, sulfuric acid, carbon monoxide, sodium hydroxide and chlorine, among others are used. The handling of most newspapers, magazines, hardcover and paperback books, art paper, paper tissues, plates and cups and glossy paper readily produces dermatitis in formaldehyde-sensitive individuals. Carbonless paper can produce mild dermatitis and severe upper respiratory symptoms as well as eye irritation. Chemical agents in various types of photocopier papers also causes dermatitis in some people.

Fleishman, Jane (1984). There's Something in the Air..: from Double Exposure: Women's Health Hazards on the Job and at Home, edited by Wendy Chavkin. Monthly Review Press, New York NY. Working Mother, pp. 114-118; October 1984.

> Occupational health experts, health professionals, working women's organizations, unions and clerical workers themselves have begun to pay close attention to the health hazards of the office workplace. Such things as low-level exposure to various office chemicals, including those used in office machinery, to artificial lighting, to inadequate ventilation, to high noise levels and to low-level radiation, are all being looked at as health hazards creating actual sickness and stress.

Foote, Robert S. (1972). Mercury Vapor Concentrations Inside Buildings: Reports. Science, Vol. 177, pp. 513-514; August 1972.

Franck, Karen A. (1985). Change: A Central But Unheralded Theme in Environmental Design Research. Environmental Change/Social Change, pp 4 - 9; Klein, S., Wener, R., Lehman, S, editors; Environmental Design Research Association; June 1985.

> If we are interested in encouraging environmental improvements which we judge to be important, we need to hone our analytic skills and to apply them to describe existing environments. One recommendation is to analyze a building's hidden program, that is, the system of mutually reinforcing social, political, and economic forces that lead to a recurring spatial relationship and physical form; and to restructure that program to produce an alternative set of spatial relationships and an alternative physical form that are more supportive of the forces that one feels should be reinforced.

Franklin, Claire A; Burnett, Richard T.; Paolini, Richard J.P.; Raizenne, Mark E. (1985). Health Risks from Acid Rain: A Canadian Perspective. Environmental Health Perspectives, Vol. 63, pp 155 - 168; 1985.

> Acid rain is causing serious environmental damage in eastern Canada. The revenues from forest products, tourism and sport fishing are estimated to account for about 8% of the gross national product. The impact on human health is not as clearcut. A multi-department program on the Long-Range Transport of Airborne Pollutants (LRTAP) was approved by the federal government in June 1980. The objectives of the program are to reduce wet sulfate depositions to less than 20 kg/ha per year in order to protect moderately sensitive areas. This will require a 50% reduction in Canadian SO2 emissions east of the Saskatchewan/Manitoba border and concomitant reductions in the eastern USA. The objectives of the health sector of the program are to assess the risk to health posed by airborne pollutants which are subjected to long-range transport and to monitor the influence of abatement programs. Two major epidemiology studies were undertaken in 1983. Preliminary analysis of the data do not indicate major health effects, but definitive conclusions must await final analysis. Studies on the indirect effects of acid depositions on water quality have shown that acidified lake water left standing in the plumbing system can adversely affect water quality and that federally set guidelines for copper and lead are exceeded. Flushing of the system before using the water rectifies the situation. Additional studies are planned to further delineate the magnitude of the health effects of acidified lake water.

Friedman, Mitchell; Dougherty, Richard; Nelson, Steven R.; White, Robert P.; Sackner, Marvin A.; Wanner, Adam (1977). Acute Effects of an Aerosol Hair Spray on Tracheal Mucociliary Transport. American Review of Respiratory Disease, Vol. 116, pp. 281-286; 1977.

Garling, Tommy; Valsiner, Jaan (1985). Children Within Environments. Plenum Press, New York; 1985.

> The most frequent harm to children is accidental injuries. This book presents a view on the prevention of childhood accidents emerging from a discussion of children and how they relate to their environments.

Gaudert, P.C. (1985). Briefing Paper on the Status of DBR Research on Contaminant Emissions from Wood-Based Composition Boards. unpublished; enquire P.C. Gaudert, DBR, NRC K1A 0R6.

> Wood based composite boards bonded with urea formaldehyde (UF) resin - especially particleboard and interior type plywood grades - have become one of the most widely used base materials for interior construction and furnishings. Such board can introduce about 50 to 150 g. of resin for

each cubic metre of air in the living space. A yearly release of as little as one to two percent of the formaldehyde contained in the resin into the air of moderately "tight", i.e. energy efficient, homes can cause the ambient concentrations to exceed the recommended 0.1 ppm limit for formaldehyde. A surplus of formaldehyde from the manufacturing process and a slowly decreasing generation of formaldehyde from hydrolysis result in an exponential emission decay with a half-life of about three to five years, i.e. the emission will decrease by half in this time.

Simulation of emissions from samples of representative, unfinished board, using dynamic chambers, have indicated that an unrestricted flow of emissions can cause ambient indoor concentrations to approach 1 ppm. In practice this concentration is usually not reached because of the diffusion resistance introduced by various surface finishes, stagnant air layers or the restriction of flow due to enclosures such as cupboards and closets.

Gelfand, Donna M.; Ficula Teresa; Zarbatany, Lynne (1986). Prevention of Childhood Behavior Disorders: from Handbook of Prevention; Edelstein, Barry A. and Michelson, Larry, editors. Plenum Press, New York, 1986; pp. 133 - 152.

Prevention of behavior problems in children depends largely on our ability to predict future maladjustments. Accurate prediction is often hampered by our lack of knowledge regarding the process by which developmental and environmental factors combine to influence the child's psychological functioning. Risk factors for children's behavioral and psychological disturbance involve a dysfunction in some aspect of the child's environment that is critical to the child's mental health such as the social community, the family, the schools. Many suggestions are made for primary prevention programs which involve restructuring the social community to remove the offending features such as poverty and lack of good housing, violence in the media, child abuse, parents who engage in antisocial behavior and alcohol abuse. Other suggestions are to provide support services for children and to help them develop coping skills for dealing with a less than optimal environment.

Geller, E. Scott (1986). Prevention of Environmental Problems: from Handbook of Prevention; Edelstein, Barry A. and Michelson, Larry, editors. Plenum Press, New York, 1986; pp. 361 - 383.

Many solutions to environmental problems require changes in human behavior, and behavioral science can offer suggestions for attacking the behavioral aspects of environmental protection. A multi-level program is proposed for environmental control and an organizational framework is presented for an energy conserving community.

Gerdas, Kendall (1987). Letter from Dr. Kendall Gerdes, Environmental Medicine Associates. Environmental Medicine Associates, 1617 Vine St., Denver CO 80206-1117; July 10, 1987.

> The author, a specialist in environmental medicine, notes that we have in the past defined health as an absence of disease. He suggests that it is considerably more than that, embodying features of sustained optimal functioning or doing every day what is possible on a person's best day. He observes that the concept of health does not include the highest functions of human beings, as typified by the Ghandis or the Mother Teresas of the world. He is convinced that we cannot create an environment which grows that type of individual, but by making the environment negative, we can prevent that type of individual from developing. One suggestion is to avoid xenobiotic chemicals. He also suggests gathering a small group of healthy Canadians and studying them in terms of both biochemistry and in terms of social structure and environment.

Gershon, S.; Shaw, F.H. (1961). Psychiatric Sequelae of Chronic Exposure to Organophosphorus Insecticides. Lancet, 1(7191), pp 1371 - 1373; 1961.

> A study of 14 men and 2 women exposed to organophosphorus insecticides for periods ranging from 1 1/2 to 10 years showed schizophrenic and depressive reactions with severe memory impairment and concentration difficulty. A field survey gave some support to the possibility that psychiatric disorders might be less frequent in towns than in fruit-growing regions of Australia where the insecticides were used. Follow-up showed that the effects of poisoning lasted for at least 6 months, but nearly all patients reverted to normal within a year.

Gibson, Bonnie (1985). Spotlight on Cadmium. Canadian Environmental Law Association Newsletter, Vol. 10, No. 1, pp. 10 -13; February 1985.

> Cadmium is a naturally-occuring heavy metal that is increasingly being released into the environment as a result of human activity. It is a highly toxic substance with no known biological function and cannot be destroyed by any environmental process. It is produced as a by-product of zinc manufacturing. The major source of exposure is inhalation in the industrial setting and as a result of accidental releases from chemical and electro-plating plants. Another source of exposure is through food and tobacco, both as a result of soil uptake of naturally-occuring cadmium as well as fertilizer residue. Concentrations of cadmium are considerably higher in second-hand tobacco smoke than to the smoker. Canadians, on an average, exceed the World Health Organization's suggested maximum permissible dietary intake level of .07 milligrams per person per day. Health effects can be lung damage and kidney damage or failure. A lethal dose is possible without warning due to lack of discomfort at the time of exposure. It accumulates in tissues and its chemical half-life can be as high as 30 years.

Giddings, Michele J. (1986). Occupational Health Problems Due to Air Exposure to Fungal Contamination. Significance of Fungi in Indoor Air, Part II, Working Papers; Health and Welfare Canada Working Group on Fungi and Indoor Air; March, 1986.

> Occupational hazards from the exposure to organic dusts, specifically fungi, in the workplace do exist. These diseases may be so mild as to be asymptomatic or be extremely debilitating. There are other diseases which may also be considered as resulting from occupational exposure. They include buildings whose humidifier and/or ventilation systems are contaminated with fungi allowing for the development of symptoms among the occupants. Recognizing the possible hazards associated with one's chosen occupation, whether it be exposure to organic dusts, chemicals or dangerous machinery is of greatest importance for prevention of injury or infection. Persistent symptoms, no matter how small, should be regarded as important and measures taken to locate their source. Care must be taken when identifying the cause of a worker's complaint, as these diseases may be misdiagnosed which in turn may lead to irreversible lung damage. An extensive bibliographic reference list is included.

Gilka, L. (1978). Childhood Experiences As Causes of Criminal Behaviour: The Report to Senator Fred A. McGrand, Chairman, The Senate Subcommittee on Childhood Experiences as Causes of Criminal Behaviour. The Society for the Understanding of Nutrition, Ottawa ON K2B 5W6; April 1978.

> An increasing number of scientists and physicians are now concluding that in many children learning disabilities may be the result of nutritional deficiencies and food and other allergies. There is now also sufficient evidence of the connection between juvenile delinquency and learning disabilities.

Girman, J.R.; Apte M.G.; Traynor, G.W.; Allen, J.,R.; Hollowell, C.D. (1982). Pollutant Emission Rates from Indoor Combustion Appliances and Sidestream Cigarette Smoke. University of California, Lawrence Berkeley Laboratory, Energy & Environment Division, Berkeley CA; May 1982.

> Keywords: gas appliances; particulate emissions; ventilation rate; gas fired cooking stoves; unvented kerosene space heaters; unvented natural gas space heaters; nitrogen dioxide; NHW

Godish, Thad (1984). Indoor Air Pollution—Offices and Other Public Access Buildings. Natural Resources Notes, No. 8; Fall 1984.

> Within the last decade there have been hundreds of reported outbreaks of illness among occupants of new or recently remodelled offices, schools, and other public access buildings. These outbreaks have

characteristically affected a large number of individuals, in some cases 30-40% of the building's population. Illness symptoms are usually of a non-specific nature often including headaches, dizziness, unusual fatigue, eye, nose and throat irritation, chest tightness and shortness of breath. The building materials and lack of ventilation are often the cause, but furnishings, office equipment, maintenance materials, accidental spills of chemicals, cross contamination from outside, tobacco smoke and microbial contaminants can also be at fault. Investigation procedures and mitigation measures are discussed.

Goldberg, Susan (1985). Facing the Nuclear Age: Parents and Children Together. Annick Press Ltd., Toronto Canada; 1985.

Researchers are demonstrating that children are aware of the arms race much earlier than adults suspect. This awareness and the perception that few adults are doing anything to prevent a nuclear war are described as resulting in a profound distrust of adults and adult values. This resource book examines the extent of the problem and is designed to help initiate discussion around the issue with children. It suggests practical responses to the questions. A complete resource list of films, videos, books, organizations, and articles on the psychological aspects of the arms race is included.

Good, Bennie W.; Vilcins, G.; Harvey, W.R.; Clabo, D.A., Jr.; Lewis, A.L. (1982). Effect of Cigarette Smoking on Residential N02 Levels: from Indoor Air Pollution; Spengler, John—editor; pp. 167-175. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

Two studies evaluating the levels and sources of nitrogen dioxide in approximately 90 employee homes in the Richmond area were performed using samplers in various rooms and outdoors. Additional data were collected concerning appliance usage, heating/cooling plant, ventilation and cigarette smoking. The largest contributor to NO 2 concentration was found to be gas-fired kitchen appliances, completely overpowering that due to the contribution from cigarettes. Nitrogen dioxide is corrosive, reactive and highly oxidizing, and may be toxic at high concentrations.

Gordis, Leon (1986). Geographic and Environmental Factors in Pediatric Cancer. Cancer, No. 58, pp 546 - 549; 1986.

It is important to determine the relative contributions of genetic and environmental factors to the etiology of childhood cancer in order to discover the pathogenic mechanisms involved and to develop effective means of primary prevention. Geographic differences in cancer incidence as well as changes in incidence over calendar time have long been used to generate clues to possible etiologic agents. The important role of genetic factors in childhood cancer is clear. The importance of the contributions of environmental factors in general and of specific factors in particular has proven more difficult to determine. A variety of environmental factors have been implicated to varying degrees in the etiology of different childhood cancers. These factors include physical agents such as radiation, chemical agents such as nitrosamines, and organic solvents, and infectious agents such as the Epstein-Barr virus. The observations that certain compounds may act as teratogens when a pre-natal exposure occurs early in pregnancy and as carcinogens when the exposure occurs late in pregnancy, suggests that there may be a continuum of teratogenesis and carcinogenesis. This finding has major implications for the possible biologic mechanisms that could be involved in childhood cancers and for the design of future research of their etiology and prevention. The etiology of childhood cancer should be viewed as an interaction of environmental factors to which the child or his or her parent were exposed together with varying degrees of genetically determined susceptibility of the child to the carcinogenic effects of these factors.

Gordon, Michael (1982). Falls in the Elderly: More Common, More Dangerous. Geriatrics, Vol. 37, No. 4, pp. 117-120; April 1982.

Keywords: accidents; aged; aging; arrhythmia; dizziness; women;

Gosnell, Denise (1987). Minutes of the Pollution and Education Committee, Toronto Board of Education, November 17, 1987. Toronto Board of Education, 155 College St., Toronto M5T 1P6..

The Toronto Board of Education's Pollution and Education Committee (Trustee level) considered total building performance investigations as a means of addressing indoor environment concerns in Toronto schools and other buildings. The procedure recognizes that a variety of elements contribute to occupants' satisfaction with a building environment, and also recognizes the special needs for those who experience greater sensitivity to the local environment. The procedure encourages all occupants to participate in the planning, design, problem-solving and operating practices of their building. Part of the rationale for the procedure is to give individuals or groups the tools to solve building environment problems.

The Committee also authorized the Director of Education, in cooperation with the Working Group of Ontario School Boards on Pollution and Education, to investigate with recognized testing laboratories the development of tests and standards for pollutants, which will assist the Toronto Board in evaluating materials which are being considered for purchase and use in the school system. The Committee voiced a parallel intent to investigate applications for rezoning of land within approximately 1000 feet of school sites, with respect to pollution from outdoor sources.

Gottlieb, Nell H.; Baker, Judith A. (1986). The Relative Influence of Health Beliefs, Parental and Peer Behaviors and Exercise Program Participation on Smoking, Alcohol Use and Physical Activity. Soc Sci Med, Vol. 22, No. 9; pp 915 - 927; 1986.

> This research specifies a model for lifestyle health behavior which includes socialization, social environmental and cognitive influences on smoking, alcohol use and exercise. Survey respondents were participants in university conditioning classes, academic health classes and a community fitness program. Of the socialization influences, drinking by both parents was directly related to drinking by females and drinking by the mother to that of males. Physical activity level of the father was associated with the activity of both genders. Parental smoking was not related to that of the respondents. Income was positively correlated with alcohol consumption in both genders and with smoking among women. In the immediate environment, drinking and smoking by male and female friends were directly associated with that of both male and female respondents with congruent gender relationships being strongest. Exercise by male friends was positively associated with activity level for both genders. For cognitive factors, belief in the efficacy of lifestyle change was inversely related to alcohol consumption for both genders and to smoking for women. Susceptibility to heart disease was associated with a low exercise frequency and smoking. With one exception, the peer modeling variables had the strongest relationships of any of the model elements. These findings suggest that prevention programs incorporate strategies to maximize peer support for healthful behavior and to counteract the effects of unhealthful behavior modeled by peers. Interventions to increase beliefs in the efficacy of lifestyle change to reduce risk are appropriate to encourage behavior change. When the change is underway, discussion of lowered susceptibility as a function of program compliance should reinforce the new behavior.

Gravesen, S.; Larsen, L.; Gyntelberg, F.; Skov, P. (1986). Demonstration of Microorganisms and Dust in Schools and Offices: An Observational Study of Non-Industrial Buildings. Allergy, No. 41, pp 520 - 525; 1986.

> The sick building syndrome is reported with increasing intensity in non-industrial places of work, such as schools, kindergartens, and offices, all of which have a heavy load of traffic (people). The construction of the buildings, with flat roofs, often leads to water damage with subsequent microbial growth. Further, reduced cleaning budgets in connection with wide use of needle-felt carpets, as well as ventilation systems not regularly maintained, will lead to pollution by dust and microorganisms. A systematic registration of dust and microbial parameters has been carried out since 1980 in buildings with indoor climate complaints, in order to elucidate the possible influence of these factors.

Green, G.H. (1979). Field Studies of the Effect of Air Humidity on Respiratory Diseases: from Indoor Climate: Effects on Human Comfort, Performance, and Health in Residential, Commercial, and Light-industry Buildings; Fanger, P.O. and Valbjorn, O.—editors; pp. 207-223. Danish Building Research Institute, Copenhagen Denmark; 1979.

> Studies have been undertaken of the effect of increasing indoor relative humidity on respiratory diseases. Kindergarten children, schoolchildren, soldiers and office workers were studied. The groups were split into rooms that were identical except for differing levels of humidity. There were significantly lower absenteeism and/or occurrences of respiratory illnesses in the spaces with the higher humidities. Increased winter relative humidity of 8 to 10% in the 22 to 50% range reduced the absenteeism from 10% in adults to 50% in kindergarten children.

Green, K.B.; Pasternack, B.S.; Shore, R.E. (1982). Effects of Aircraft Noise on Reading Ability of School Age Children. Archives of Environmental Health-CISTI; Vol. 37, No. 1, pp. 24-31; 1982.

> The percent of students reading below grade level from 1972 to 1976 was regressed on racial, socioeconomic, educational, and noise level variables for all elementary schools in Brooklyn and Queens, New York. Schools were assigned noise exposure scores based on Noise Exposure Forecast contours for New York City airports. The correlations between these noise scores and a variety of noise level metrics ranged from 0.74 to 0.97. The regression coefficients adjusted for confounding factors, indicated that an additional 3.6% of the students in the noisiest schools read at least 1 year below grade level with 95% confidence limits from 1.5 to 5.8%. The dose-response relationship indicated that the percent reading below grade level increased as noise level increased.

Green, Kendall B.; Pasternack, Bernard S.; Shore, Roy E. (1982). Effects of Aircraft Noise on Hearing Ability of School-Age Children. Archives of Environmental Health, Vol. 37, No. 5, pp. 284-289; September/ October 1982.

> 201 cases with permanent bilateral high-frequency hearing loss and 208 controls with normal hearing were identified through the New York City hearing screening program. Aircraft noise exposure was estimated for the residences of cases and controls from Noise Exposure Forecast contour maps of the New York City airports. The noise exposure estimates had a correlation on 0.89 with noise level measurement made in the area. Birth certificates and questionnaires were used to provide additional information on other sources of noise exposure and potential confounders. The results showed a positive, but not statistically significant association between aircraft noise exposure and the risk of high-frequency hearing loss.

Greer, Nora Richter (1986). The Search For Shelter. The American Institute of Architects, Washington DC; 1986.

> Many Americans are homeless. They have a right to dignified shelter which is investigated in this book. Case studies are presented.

Greer, Nora Richter (1986). Paths to Homelessness. The Search For Shelter; pp. 17 - 22; The American Institute of Architects, Washington DC; 1986.

> The immediate causes of homelessness are diverse: loss of a job, physical or mental disability, loss of benefits, divorce, etc. But the plight of the homeless represents the most severe housing shortage since the Depression. The problem centres on the dwindling supply of housing for those with the lowest incomes.

Greer, Nora Richter (1986). Dignified Shelter. The Search For Shelter; pp. 31 - 35; The American Institute of Architects, Washington DC; 1986.

> When designing shelters and programs for the homeless, it is perhaps most important to create a sense of dignity. Design considerations are presented which would create shelters and more permanent housing, as well as service delivery vehicles which would be dignified and take into account the physical as well as the psychological needs of the homeless.

Greer, Nora Richter (1986). The Right To Shelter. The Search For Shelter; pp. 37 - 41; The American Institute of Architects, Washington DC; 1986.

> One of the biggest obstacles facing developers of shelter or low-income housing is community resistance. The 'not in my backyard' phenomenon is occuring in countless communities. Strategies for helping communities feel comfortable with this type of housing are presented. These include communicating with the community at an early stage about the proposed facility and how it works, promising priority placement in the shelter to people from the surrounding community, and designing it to be compatible with surrounding buildings. Reevaluation must also occur of municipal building code definitions of suitable, affordable housing, as well as that of emergency and transitional shelter.

Gregory, Judith (1981). Office Air Quality, 'Tight Buildings', and Job Stress - The Impact on Women Office Workers' Occupational Health. Working Women Education Fund, 1224 Huron Rd., Cleveland OH 44115; May 25 1981.

> **Keywords:** indoor air pollution; occupational hazards; stress; workplace; ventilation; offices;

Griffith, Ezra E.H.; Griffith, Elwin J. (1986). Racism, Psychological Injury, and Compensatory Damages. Hospital and Community Psychiatry, Vol. 37, No. 1; pp 71 - 75; January, 1986.

Psychiatrists and other mental health professionals have paid only modest attention to the idea that discriminatory conduct causes emotional suffering for those who are the object of it. However, courts have held that if such racist conduct is willful and outrageous and the ensuing suffering is severe, the plaintiff has a reasonable claim to compensatory damages. The authors trace these developments in the legal area in both tort actions and complaints under civil rights statutes. They also point out how psychiatrists could be more influential in sharpening considerations about the idea that racism causes psychological injury.

Grimsrud, D.T.; Sherman, M.H. (1982). Energy Efficient Domestic Ventilation Systems for Achieving Acceptable Indoor Air Quality: A Comparison of Alternate Ventilation Strategies. The Air Infiltration Centre, Old Bracknell Lane W., Bracknell, Berkshire RG12 4AH England; 1982.

Keywords: ventilation; measurement of pollution; indoor air quality;

Guidotti, Tee L.; Goldsmith, John R. (1983). Air Pollution and Family Health. American Family Physician, Volume 27, number 4, pp 165-172, April 1983.

Air pollution is classified according to chemical characteristics of the pollutants and sources: reducing air pollution, photochemical air pollution, point-source emission and indoor air pollution. The primary pollutants are particulates, oxides of sulfur and nitrogen, ozone, hydrocarbons, carbon monoxide and lead. A knowledge of the effects of these on healthy people and impaired patients can provide the physician with specific measures to apply in individual cases. These effects are described under the headings: respiratory system effects, cardiovascular effects, mucosal irritation, carcinogenesis, neurologic effects.

Gupta, K.C.; Ulsamer, A.G.; Preuss, P.W. (1982). Formaldehyde in Indoor Air: Sources and Toxicity: from Indoor Air Pollution; Spengler, John—editor; pp. 349-358. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

Formaldehyde, a highly reactive gas with a pungent odour, is released from a variety of sources including urea-formaldehyde foam insulation, particle board, and plywood, as well as various combustion processes. Concentrations of formaldehyde associated with the presence of these products are higher indoors than outdoors. Under controlled conditions, formaldehyde causes eye and nasal irritation at air concentrations of 0.24 mg/m 3 and above. Exposure, residential or occupational, has been associated with eye, nose, and throat irritation, coughing, wheezing, skin rashes, nausea, and other symptoms. Formaldehyde is also a sensitizer; individuals who are allergic to it, or who suffer from respiratory diseases, are likely to suffer its effects at even lower concentrations. Based on its known metabolism, reactivity with DNA and other macromolecules, as well as its mutagenic effects, formaldehyde is thought to be genotoxic. Recent studies have also indicated that it is a carcinogen in rats and probably in mice.

Haan, Mary; Kaplan, George A.; Camacho, Terry (1987). Poverty and Health: Prospective Evidence from the Alameda County Study. American Journal of Epidemiology, Vol. 125, No. 6, pp 989 - 998; 1987.

To examine the reasons for the association between socioeconomic status and poor health, the authors examined the nine-year mortality experience of a random sample of residents aged 35 and over in Oakland, California. Residents of a federally designated poverty area experienced higher age-, race-, and sex-adjusted mortality over the follow-up period compared with residents of nonpoverty areas. This increased risk of death persisted when there was multivariate adjustment for baseline health status, race, income, employment status, access to medical care, health insurance coverage, smoking, alcohol consumption, physical activity, body mass index, sleep patterns, social isolation, marital status, depression, and personal uncertainty. These results support the hypothesis that properties of the sociophysical environment may be important contributors to the association between low socioeconomic status and excess mortality, and that this contribution is independent of individual behaviours.

Haider, M.; Groll-Knapp, E.; Holler, H.; Neuberger, M.; Stidl, H. (1976). Effects of Moderate C0 Dose on the Central Nervous System—Electrophysiological and Behaviour Data and Clinical Relevance. from Clinical Implications of Air Pollution Research, Finkel and Duel, editors; Chapter 17, pp. 217-232; Publishing Sciences Group, Inc.; 1976.

Many aspects of human performance are apparently affected even by low C0 levels, while others show an impairment only considerably later. The capacity for observation in situations involving comparatively weak stimulation could be a very sensitive indicator, while complex psychomotor dexterity is only slightly affected. Sleeplessness, irritability, restlessness, headaches, disturbances of well-being are all symptoms that have many causes. One of these may be C0, but each case has to be tested individually and further research is needed to clarify the extent to which such a statement can be verified.

Hall, Chris (1987). Aging Well: Focus on Growing Old and Staying Gay. Xtra, No. 89, p. 5; Nov, 27, 1987.

> A November 7-8, 1987 Conference on Gays and Lesbians Aging reviewed the problems and options faced by older gay people in Canada. While gay people have many of the same needs in aging as their heterosexual counterparts, gay people also have many needs that are unique to them. In housing, for example, there is no existing structure that allows for lifelong lovers to share facilities in an institutional setting. The conference stressed the importance of maintaining good health to increase the quality of life in the later years. Workshops were held on maintaining independence in the home, creating change within the system, and developing a supportive social network.

Hall, Muriel (1987). Frustrations of Hypersensitivity. unpublished; July, 1987.

> The most demoralizing and frustrating experience for the person with chemical hypersensitivity is that, while being seriously ill, weak, exhausted, confused, in pain, and isolated, one must also fight spouse, children, extended family, neighbors, friends, community, all levels of government, doctors, hospitals, social services, OHIP, OMA, psychiatrists, employers, insurance companies, pension and/or welfare agencies — in fact, the whole world — in order to survive.

Hall, Muriel (1987). Healthy Living. unpublished; September, 1987.

> Some of the frustrations coping with hypersensitivities in a world full of toxins, in a society geared to oppression of misfits (with psychosomatic illness), are perfumes built into stationery and periodicals; visitors who lack the knowledge or sensitivity to eliminate completely the use of cosmetics, body and clothing care products which contain perfumes; relatives who treat the illness as psychosomatic and who ignore the environmental causes of the illness, refusing to change them; and the incredible feeling of hopelessness at being misunderstood, put-down, ignored, talked over, assumed to be retarded or hard of hearing. Education of patients, families, communities, church groups, the medical profession, educators, social and welfare agencies, law enforcement officers, penal institutions, and other providers of housing and services is necessary.

Halton, David M. (1983). Occupational Exposures from Spirit-Duplicator Operations. Canadian Centre for Occupational Health & Safety, Hamilton ON L8N 1H6; October 1983.

> The current technology used in spirit duplicating is discussed. A number of studies have indicated the potential for methanol overexposure from these machines. These are described here, along with the negative health effects. The various exposure-control strategies are reviewed.

Halton, David M. (1983). Photocopiers—Do They Pose a Health Hazard?. Canadian Centre for Occupational Health & Safety, Hamilton ON; April 1983.

> The current technologies used in photocopying machines are briefly described. Concerns that have been raised about health and safety at each step of the copying process are discussed. Particular emphasis has been placed on the chemical components of the technology. Areas of specific concern are : the refilling and disposal techniques for toner in dry machines; levels of isodecane produced by LTT machines; levels of ozone produced; heat and noise levels; and escape of ultraviolet light.

Hambraeus, A. (1986). Microorganisms Related to Buildings. Indoor Air, Vol. 6, 1986; Swedish Council for Building Research, Stockholm Sweden; Berglund, B.; Berglund, U.; Lindvall, T.; Sundell, J.; editors.

> Very little knowledge is available concerning the effect of the building-related microorganisms on people or buildings. More information on the clinical significance is needed.
>
> For instance, in a simulated office space, it was shown that the HVAC system operational parameters affect airborne fungal levels in occupied spaces. The reduction of airborne fungi correlated well to the number of airchanges when the filter system was intact. When the main air handling unit was operated without its filter bank, fungi were dispersed into the air. The fan coil units were found to be important sources of microbial aerosols. Indoor air always contains viable mould spores but in buildings that do not generate their own sources of mould, the numbers are usually low and the species found are similar to those found in outdoor air. The classical sources of in-house generated mould are found in high water vapour risk areas such as bathroom and kitchen. Problems in this area can be increased due to reduced ventilation which has been introduced for energy saving. There are other problems that might be caused by microorganisms in buildings. For instance, the presence of occupational asthma and humidifer fever was investigated in two air conditioned office buildings which had humidifiers designed to produce around 50% relative humidity. And in newly built homes where self-leveling cement has been used, problems with foul smell and miscoloured floors have occurred. Occupants and office workers have complained of symptoms such as headache, tiredness, and allergic reactions. Microorganisms have been suspected to cause degradation of the protein in the cement.

Hancock, Trevor (1980). The Soft Health Path: An Alternative Future for Health in the 80's. March, 1980.

> A new approach to health care is emerging which can be described as the Soft Health Path. It is a synthesis of environmental health, community-based public health, the primary health care concept, the holistic health movement and the self-care movement. It is compatible with and leads towards a sane, humane and ecological future.

Hancock, Trevor (1987). Healthy Public Policy in the Nordic Countries: Preliminary Report: CPHA Study Tour Report. Canadian Journal of Public Health, Vol. 78, pp 9 - 10; February, 1987.

> Fourteen Canadians from 5 provinces spent 3 weeks studying health policy and promotion in Denmark, Norway, Sweden, and Finland as a result of the October 1984 Beyond Health Care conference on healthy public policy. The policies in these countries are briefly described. Preliminary conclusions are drawn: 1) Central government leadership is essential in formulating a health policy that moves beyond health care to address health for all and health promotion policy but efforts must be directed to the Provincial ministers of health and their staffs; 2) Local action must be initated to develop public awareness of Health for All and to develop intersectoral policies to promote health; 3) A greater awareness must be developed of the social nature of health, identifying inequalities in health and making them apparent to policy makers and the public.

Hane, Monica; Axelson, Olav; Blume, Jan; Hogstedt, Christer; Sundell, Lennart; Ydreborg, Berit (1977). Psychological Function Changes Among House Painters. Scand. j. work environ. & health, No. 3, pp. 91-99; 1977.

> Keywords: brain damage; hemoglobin concentration; psychological function tests; solvents; work environment;

Hanvey, Louise (1987). Communique. Canadian Institute of Child Health, Ottawa ON; 1987.

> Even playgrounds with equipment specifically designed for children can be hazardous places. A 1983 study found that Canadian hospitals 934 injuries resulting from playground apparatus, many from falls. The Canadian Institute of Child Health has released "When Child's Play Is Adult Business", publication designed for parents and concerned citizens which spells out the difference between a safe and dangerous playground.

Harding, Douglas H. (1982). Health Effects of Formaldehyde. Occupational Health in Ontario, Vol. 3, No. 2, pp. 64-80; April 1982.

> The possibly erroneous idea that formaldehyde is a carcinogen is explained in this review. The argument is presented that this substance is an epigenetic carcinogen based on its irritancy and high reactivity. It is the irritancy and not the formaldehyde chemical that induces the chain of events leading to malignancy. The threshold for irritation of formaldehyde is 0.1 ppm, and if such a level were used to control exposure to the chemical, it would be expected that the danger from formaldehyde-induced cancer would be greatly reduced. Possible sources of formaldehyde are listed: cigarette smoke, automotive exhaust, photochemical smog, incinerators, urea formaldehyde in fabrics and building materials. There are individuals who have become hypersensitized to formaldehyde and must avoid it at all costs.

Harrison, John (1983). Artsmart. Living Safety, No. 4, pp. 26-29; Winter 1983.

> Art and craft materials can be hazardous to health. Particularly vulnerable are the elderly, children, and people with health problems. Particularly hazardous are ceramics, printmaking, painting and sculpting. Hazards and precautions are described.

Hart, Dr. Roger (date?). Sex Differences in the Use of Outdoor Space. Perspectives on Non-Sexist Education, Chapter 8, pp 101 -109.

> The physical environment is essentially boys' domain. A study was conducted of young children who were asked to identify the area in which they were allowed to play outside your house without special parental permission. There were two age groups: five- to eight-year-olds and nine-to-twelve-year-olds. In both age groups the boys' range was larger than the girls' but most markedly so in the older age group. It was concluded that parentally-defined range restrictions restrict the movement of girls in the outdoor environment. It was also found that boys modify the landscape more frequently and more effectively than girls who instead use their imaginations to create outdoor spaces. Girls and boys receive multiple reminders from adults and from peers as to what are and are not suitable activities for them. It seems that girls are practicing and being prepared for roles in the home and boys for roles outside. The very different opportunities given to girls versus boys to freely manipulate the environment affects their spatial abilities and other types of problem solving. It is important that all children have the freedom, ability, and confidence to define and carry out their goals.

Hathaway, Warren E. (1983). Lights, Windows, Color: Elements of the School Environment. Alberta Education, 11160 Jasper Ave, Edmonton Alberta T5K 2L0; January 1983.

> Recent research indicates that there are a great many non-visual effects of light on people. Of these effects, the suntan effect and the control of rickets are two that are well understood. Other important but less well known effects include synchronization of a number of physiological rhythms, and prevention or control of infantile jaundice. Still other research indicates that variations in the quality of light can influence student achievement and behaviour. Closely related to light is colour and there are studies which indicate that colour too can produce measurable effects in the classroom. The reported research is sufficiently conclusive to allow the suggestion that light and colour have predictable effects on students and that learning environments can be designed to foster these predictable effects.

Health and Welfare Canada (1975). Health and Built Environment. Health Facilities Design Directorate, Health and Welfare Canada; 1975.

> This conference examined the evidence of ill health and other effects on human well-being resulting from interaction with the built environment. Society often militates against individuals adopting lifestyles leading to good health. There is a need for a new type of cost-accounting which looks at long-term health effects of good environments. Environmental design should be for promotion of health, and although some risk-taking is healthy, people are not always in a position to evaluate environmental risk in that respect. Design for health may become a question of consciousness raising, increasing perception and broadening fields of concern. People should be given a feeling of competence in dealing with their designed environment. Also discussed are computer-related problems, self-help systems and alternatives to health care, research, education, professional training, facility design, risk, and standards.

Health and Welfare Canada (1976). Health Promotion Through Designed Environment: Conference Report. Health and Welfare Canada, Health Programs Branch; October, 1976.

> The conference was convened to examine the evidence of ill health and other effects on people's well being resulting from interaction with the built environment; deal with what may be called the institutionalization and individualization of health; to discuss the promotion and maintenance of health; and to examine the application of design to the planning for health.

Health and Welfare Canada (1980). Workshop on Window Design: Considerations For Health and Well-Being. Health Services and Promotion Branch, Health Facilities Design Division, Department of National Health and Welfare, Ottawa Canada; March 1980.

> This volume contains the proceedings, transcribed in discussion format, of a three-day meeting of window and building design experts from the United Kingdom, the United States, and Canada. It addresses the history and the state of the art of window design, the building code, biological/emotional/aesthetic considerations, and the disadvantages of windowless environments. It was concluded that evaluation of windowless environments, and especially deep-core buildings, is a research priority.

Health and Welfare Canada (1982). Canadian Governmental Report on Aging. Department of National Health and Welfare, Ottawa ON; June 1982.

> The health of older persons affects, and is affected by, a number of factors including income security, employment opportunities, life with-

in the family and community, leisure activities, living arrangements, and social service needs. A holistic approach to health in old age is needed. The health care system should promote the highest possible functional independence and health among the aging, provide appropriate care in an integrated and coordinated way, ensure equitable and reasonable access to appropriate services, and provide for the needs of those among the aging who require special care. Suggestions include health promotion programs from an early age, increased safety awareness to prevent falls and other accidents, development and use of vaccines to prevent respiratory illness, physical and mental fitness promotion, improved psychiatric services, more intensive and extensive education about normal age-related processes, proper packaging and labelling of drugs and the monitoring of adverse drug reactions, and on-going evaluation and control of medical devices. There is a need for improved coordination in the planning, development, and implementation stages of policies and programs, and in the delivery of services. Integration of health and social services delivery needs to be improved country-wide. The uneven distribution of health services between provinces, as well as the larger urban centres and smaller urban and rural communities within provinces, also affects the health of the aged as do limits to access to services due to language, distance, cultural background, and so on.

Heath, Lormar (1981). Gay Fathers: Some of their Stories, Experience, and Advice. Gay Fathers of Toronto, PO Box 187, Stn F, Toronto M4Y 2L5; 1981.

The authors describe difficulties experienced by fathers who are gay, citing specific experiences involving marriage breakup, access to children, discrimination, and the process of coming out. For whatever reasons, many men who are homosexuals do marry or establish continuing relationships with women, and do father children. The life of the gay father is often fraught with the fears and anxiety that come from leading a double life. They experience the conflict between what society expects of them, and what they come to realize is a deep and unalterable part of themselves. They feel a need to express their identity but do not want to jeopardize their relationship with their children or damage them in any way. The authors attempt to contradict common stereotypes, and to reduce the isolation of gay fathers. Additional bibliography available from publisher.

Helsing, K.J.; Comstock, G.W.; Meyer, M.B.; Tockman, M.S. (1982). Respiratory Effects of Household Exposures to Tobacco Smoke and Gas Cooking on Non-Smokers: from Indoor Air Pollution: Proceedings of the International Symposium on Indoor Air Pollution, Health and Energy Conservation; Spengler, John— editor; pp. 365-370. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

The records of 708 nonsmoking white adult residents of Washington Co, MD, who had participated in two studies of respiratory symptoms were

analyzed to evaluate the effects of exposure at home to two potential sources of indoor air pollution: cigarette smoking by other household members, and use of gas as a cooking fuel. After adjustment for the effects of age, sex, socioeconomic level, occupational exposure to dust, and years of residence in household, the presence of one or more smokers in the household was only suggestively associated with a higher frequency of chronic phlegm and impaired ventilatory function. The use of gas for cooking was associated with a significantly increased frequency of chronic cough and a significantly greater percentage with impaired ventilatory function.

Henderson, A.S.; Grayson, D.A.; Scott, R.; Wilson, J.; Richwood, D.; Kay, D.W.K. (1986). Social Support, Dementia and Depression Among the Elderly Living in the Hobart Community. Psychological Medicine, No. 16; pp 379 - 390; 1986.

In a community sample of the elderly in Hobart, Tasmania, cases of dementia and depression were ascertained by the Canberra Geriatric Mental State and the Mini Mental State Examination. Social relationships and support were examined by means of the Interview Schedule for Social Interaction. The elderly had fewer social relationships than younger adults, but were more content with what they did have. Elderly women had more affectional ties than elderly men. The presence of offspring in the same town increased the number of close ties and of social relationships, but was more important for men than for women. Persons with cognitive impairment or an established dementia reported that they had less social interaction than they would like. Depressed subjects reported having markedly less social interaction than the mentally healthy elderly, but did not complain that it was too little.

Henzi, H. (1984). Chronic Methanol Poisoning With The Clinical and PathologicAnatomical Features of Multiple Sclerosis. Medical Hypotheses; No. 18, pp. 63-75; 1984.

The details of two cases of chronic methanol poisoning are presented. Both patients initially developed clinical symptoms of multiple sclerosis: visual disturbances, intention tremor; reduced abdominal reflexes, impaired coordination and difficulties with walking. After the exposure to methanol had ceased, the multiple sclerosis symptoms persisted in one patient but disappeared gradually in patient 2. The results are discussed in connection with the theory that under certain circumstances multiple sclerosis itself is induced by formaldehyde stemming from the metabolism of methanol.

Hertzman, Clyde (1986). The Health Context of Worklife Choices: A New Work Agenda for Canada. Canadian Mental Health Association, Toronto Canada; 1986.

The relative average life expectancy rates of males and females widens around age 40 in response to gender differences in risk, including the differences between middle-aged men and women in their relationships to the world of work. There is, however, a lack of data and methodology to estimate the proportion of the differences in health status between men and women, and between socioeconomic groups, attributable to the physical, chemical, and biological hazards related to work. Evidence linking unemployment to poor mental health does exist and is stronger than that linking it to poor physical health.

Hess. C.T.; Weiffenback, C.V.; Norton, S.A. (1982). Variations of Airborne and Waterborne Radon-222 in Houses in Maine: from Indoor Air Pollution; Spengler, John—editor. Environ. Int., Vol. 8, No. 1/6, pp. 59-66; 1982; Pergamon Press, Oxford and Toronto.

Concentrations of airborne radon ranging from 0.05 to 135 pCi/L were found in houses in Maine during the period October 1980 to May 1981. To investigate the association between elevated radon concentrations in well water and the indoor airborne radon concentrations, the radon in the water supplies of these houses was measured by liquid scintillation. Monitors of airborne radon, recording in intervals of 10 min for periods of 5 to 7 days, were used for dynamic studies in 18 houses, determining the component of airborne radon in bursts. House residents kept logs noting the time of major water uses. For some of the houses, ventilation rates ranging from 0.3 to 2 air changes per hour were determined. The component of airborne radon associated with water sources was found to vary inversely with ventilation rate and directly with waterborne radon concentration. According to the the data are pertinent to a study which revealed significant correlations between county averages, from the National Cancer Institute, or age-adjusted cancer mortality rates in Maine and average values of radon concentrations in water for the counties.

Hexter, Alfred C.; Goldsmith, John R. (1971). Carbon Monoxide: Association of Community Air Pollution with Mortality. Science, Vol. 172, pp. 265-267; April 16 1971.

Keywords: carbon monoxide; indoor air pollution; health hazards;

Hickey, Richard J.; Clelland, Richard C.; Bowers, Evelyn J.; Boyce, David E.; Alarie, Yves (1976). Health Effects of Atmospheric Sulfur Dioxide and Dietary Sulfites (and Rebuttal). Archives of Environmental Health, pp. 108-112; March/April 1976.

Some animal studies have shown that exposure to low levels of sulfur dioxide and dietary bisulfite is relatively harmless. To the contrary, sulfite oxidase deficiency is known in man, bisulfite is mutagenic for several test organisms, and the atmospheric sulfur dioxide level is positively correlated with death rates for several chronic diseases among some human populations. The studies reporting harmlessness for animals may be misleading because of the fallacy of typology.

Hijazi, N.; Chai, R.; Bradstreet, J.W.; Duffee, R.A.; Astle, A.; Amster, M. (1983). Indoor Organic Contaminants in Energy Efficient Buildings. TRC Environmental Consultants, Inc., 800 Connecticut Blvd., East Hartford, CT, USA 06108, (203)-289-8631.

> This private sector report describes the use of the TAGA gas-chromatograph mass-spectrometer (GCMS) equipment for measuring volatile contaminants in indoor or outdoor air. The discussion includes a listing of common chemicals found in trace amounts indoors.

Hildingson, Olov (1982). Radon Measurements in 12,000 Swedish Homes: from Indoor Air Pollution; Spengler, John—editor. Environ. Int., Vol. 8, No. 1/6, pp. 67-70; 1982; Pergamon Press, Oxford and Toronto.

> Radon daughter levels have been monitored in 12,000 Swedish homes during the last two years using two methods; a track-etch detector and a filter sampling technique with determination of ventilation rate. In 1979, the Swedish government introduced temporary limits for the radon daughter concentration in dwellings. For existing buildings, this limit is 400 Bq/m 3 (0.11 WL). Close to 15% of the investigated houses have a radon daughter concentration higher than the limit. Almost 10% have a concentration about 1000 Bq/m 3 (0.27 WL). The results from this study show that the two most important sources for radon in buildings are building materials and the ground.

Hirdes, John P.; Brown, K.S.; Vigoda, Debby S.; Forbes, W.F.; Crawford, Lawrence (1987). Health Effects of Cigarette Smoking: Data from the Ontario Longitudinal Study on Aging. Canadian Journal of Public Health, Vol. 78, pp 13 - 17; January/February, 1987.

> The association between cigarette smoking and mortality is well established, but a similar association between cigarette smoking and morbidity is less well documented. This report describes an analysis of data obtained from the Ontario Longitudinal Study of Aging which represents a cohort of about 2,000 males of similar age, which have been followed over a 20 year period since 1959. Smokers were more likely to report poorer health and permanent disability. Drop-outs, because of death and lack of interest were significantly greater for smokers than for non-smokers.

Hirschman, Shalom Zarach; Feingold, Murray; Boylen, George (1963). Mercury in House Paint as a Cause of Acrodynia: Effect of Therapy with N-Acetyl-D,L-Penicillamine. The New England Journal of Medicine, Vol. 269, No. 17, pp. 889-893; Oct. 24 1963.

> Keywords: mercury; building materials; air pollution; acrodynia;

Hoff, H. (1964). Mental Health Implications in the Peaceful Uses of Nuclear Energy. Social Implications of the Peaceful Uses of Nuclear Energy; UNESCO, pp 99 - 104; Klineberg, Otto, editor; 1964.

> Emotional reactions to proposed and actual use of atomic energy for peaceful purposes include anxiety and fear — especially of automation, biological chain reactions, and poisoning of air, water and food. Such anxieties inevitably develop pathological defense mechanisms, such as denial, repression, and regression to infantile behaviour, that demand immediate gratification.

Holland, Jerry (1987). A Message From the President of One Voice. One Voice - La Voix, Vol. 1, No. 1, p 1; Ottawa Canada; July, 1987.

> One Voice - The Canadian Seniors Network - is a national, non-profit organization which was founded in March, 1987 to help overcome the barriers that separate seniors from the government and to help governments understand seniors' perspectives on current issues, including health, housing, economic and other pressing social policy issues. It operates under the belief that Canadian's attitudes towards aging can be changed for the better. The newsletter, One Voice - La Voix, facilitates communication among individuals and groups

Holland, Walter W. (1974). Effects of Air Pollution on Children. Pediatrics, Vol. 53, No. 5, Part II, pp. 839-841; May 1974.

> This article discusses the chronic and acute effects of exposure to high levels of air pollution, specifically impaired respiratory function.

Hollands, John (1984). Environmental Concerns in Offices and Homes: Conference Report. University of Toronto Staff Association Newsletter, Vol. XIV, No. VI, pp. 7-8; October 1984.

> This is a report on a conference on Environmental Concerns in Offices and Homes, held at the University of Western Ontario's Occupational Health and Safety Resource Centre on September 24 and 25, 1984. Ministry of Labour representatives are reported as suggesting that the sick building syndrome symptoms of headaches, drowsiness, tired eyes and upper respiratory irritation, is caused by inadequate ventilation in modern airtight buildings. VDT user fatigue, eye fatigue and radiation measurement studies were also discussed.

Hollenberg, C.H.; Siminovitch, L. (1986). Importance of National Centres of Research to Canadian Health Care and Medical Science. CMAJ, Vol. 135, pp 195 - 196; August, 1986.

A close relationship exists between the quality of a nation's health care services and the quality of its medical research programs. High-quality medical research endeavours can now be found in all Canadian medical schools and in some teaching hospitals. These efforts are based on the contributions of widely dispersed investigators usually working in small groups. While this approach to medical research has been successful in establishing the broad base of science required to support our educational institutions, it has become apparent that it is no longer adequate to meet all of the technologic and interdisciplinary demands of contemporary medical research. Many of the important research problems of our time can only be approached in a definitive manner by mobilizing the efforts of relatively large groups of scientists and providing them with often high-cost technology. Such concentrations are beyond the present capacities of universities, in spite of expanded facilities in Calgary, Toronto, London, and Winnipeg. The correction of the deficiencies will require a very significant change in the amount of money available for medical research and in the way the money is used. The federal government, acting in association with the private sector, could initiate a new program to create a group of major Canadian centres of research in proximity to those universities and health science centres that have developed a significant scientific base in relevant disciplines. Initiatives should be selected carefully, bearing mind the major thrusts of contemporary science, those diseases of great importance to Canadians in which a major research investment is likely to pay off and those research developments likely to spark commercial exploitation.

Hollowell, C.D.; Budnitz, R.J.; Traynor, G.W. (1976). Combustion-Generated Indoor Air Pollution. University of California, Lawrence Berkeley Laboratory, Energy and Environment Div., Technical Information Dept., Berkeley CA 94720; Dec. 1976.

Keywords: air pollution; heaters; carbon monoxide; nitrogen compounds; nitrogen oxides; sulfur compounds; sulfur oxides; health hazards; buildings; combustion products; cooking devices; space heaters;

Hollowell, Craig D.; Berk, James V.; Lin, Chin-I; Turiel, Isaac (1979). Indoor Air Quality in Energy-Efficient Buildings. University of California, Lawrence Berkeley Laboratory, Berkeley CA; March 1979.

This reference is one of a long series of competent articles containing experimental data regarding indoor air pollution, produced by the Lawrence Berkeley Laboratory of the University of California at Berkeley. The reader can obtain a listing by writing directly or by enquiring of the U.S. National Technical Information Service (NTIS), with which most of the papers are registered.

Hollowell, Craig; Berk, James V.; Traynor, Gregory, W. (1979). Impact of Reduced Infiltration and Ventilation on Indoor Air Quality in Residential Buildings. ASHRAE Transactions, Vol. 85, Pt 1, pp. 816-827; 1979.

Keywords: buildings; ventilation; energy conservation; air pollution; health care; nitrogen compounds; formaldehyde; indoor air quality;

Hollowell, C.D.; Berk, J.V.; Boegel, M.L.; Miksch, R.R.; Nazaroff, W.W.; Traynor, G.W. (1980). Building Ventilation and Indoor Air Quality. University of California, Lawrence Berkeley Laboratory, Energy & Environment Div., Berkeley CA 94720; January 1980.

Keywords: ventilation; indoor air pollution; carbon monoxide; nitrogen dioxide; formaldehyde; radon; energy efficient building;

Hollowell, Craig D.; Miksch, Robert R. (1981). Sources and Concentrations of Organic Compounds in Indoor Environments. Bulletin of the N.Y. Academy of Medicine, Vol. 57, No. 10, pp. 962-977; December 1981.

Keywords: human; building material; smoking; formaldehyde; indoor air pollution; health hazards; nitrogen dioxide; safety standards;

Holma, B.; Kjaer, G.; Stokholm, J. (1979). Air Pollution, Hygiene and Health of Danish Schoolchildren. The Science of the Total Environment, Vol. 12, pp. 251-286; Elsevier Scientific Publishing Co., Amsterdam; 1979.

A comprehensive investigation forming part of a joint European study under the auspices of "WHO Long-Term Air Pollution Programme" uses 7-13 year old school children as the target group. The study has included social, housing, hygienic and epidemic factors as well as family smoking habits. The results indicate that, at exposure to low levels of air pollution, these factors dominate as causes for the impairment of health, especially that of respiratory health.

Holt, John (1987). Watching Children Learn: Correcting Mistakes. Growing Without Schooling, No. 57, p 9; 1987.

Intellectual learning is facilitated best by allowing children to figure things out on their own because it fosters remembrance and confidence. Rather than correction of errors, we should provide them with acceptance and recognition at having performed an intellectual feat. Children learn as they breathe — it is in their very nature to take the world in with their senses, and to make sense of it, without being aware of how or why they are doing it. A great error is made when, by correcting them, we make them self-conscious of their learning, so that they begin to ask themselves if they are learning or not and so, through worry, turn off their learning. When people see the world as a place of danger, from which they must protect themselves — in short, when they begin to live less freely and fully — that is when learning dies down.

Hooker, C.A. (1982). The Human Context for Science and Technology: Final Report. Social Sciences and Humanities Research Council of Canada; March, 1982.

As an area of study, the Human Context for Science and Technology will demand an integrated approach transcending disciplinary and institutional boundaries. It will also involve a fundamental re-integration of human values into the inquiry process. Existing Canadian research activity in this area is inadequate because it is insufficient, uneven, narrow, and socially incomplete and unrepresentative. All too often, many groups and constituencies like women, industrial workers, and those whose jobs may be eliminated by the spread of microelectronics, have legitimate and pressing concerns but are excluded from access to the resources needed and from opportunities to articulate their perspective and develop their own analysis of the issues.

Hopkirk, Gerald (1986). Mental Fitness in the Workplace: Worklife Choices for Professionals in a Medium Size School System. Work and Well-Being Quarterly, Issue 1; pp 8 - 11; Canadian Mental Health Association, Toronto ON; Fall, 1986.

This paper describes a school system, its philosophy of administration, and the worklife choices available to its 600 professional staff members. Described are policies for leaves of absence, job sharing, flexible part-time work, and transfers. The employer operates under the assumption that the provision of meaningful worklife choices for employees is advantageous to employer and employee alike and is well worth the resources and energy spent on it. Helping people find work situations that allow them to reach personal goals they define for themselves make the organization a dynamic, fulfilling place to work and creates the type of climate conducive to effective performance.

Hosein, H. Roland; Corey, Paul (1986). Domestic Air Pollution and Respiratory Function in a Group of Housewives. Canadian Journal of Public Health, Vol. 77, pp 44 - 50; January/February, 1986.

Air pollution exposure was determined to sulfur dioxide, nitrogen dioxide, and respirable suspended particulates for a group of symptomatic housewives and a matched control group using a specially designed domestic air pollution sampler. The nitrogen dioxide and respirable suspended particle levels were higher indoors than outdoors, whereas the sulfur dioxide levels were higher outdoors. The cases and controls showed the same air pollution exposures. The use of gas stoves resulted in elevated levels of nitrogen dioxide which might account for the observed reduction in lung function of residents in homes with gas stoves. Cigarette smoking indoors resulted in elevated particulate levels.

Huggins, Hal. A. (1982). Mercury: A Factor in Mental Disease?. Journal of Orthomolecular Psychiatry, Vol. 11, No, 1, pp 3 - 16; 1982.

Many ramifications of physical and mental health need investigation in light of the potentially hazardous effects of mercury toxicity. Suggestions have been forwarded that mercury leaching out of dental amalgam filling can affect the peripheral nervous system, immune system, and cardiovascular system, and that mercury in a biological system appears to create or mimic many disorders in these three areas. The case of a young girl has been presented which has been thoroughly investigated through hospital and direct evaluation by psychiatrists, internists, osteopaths, chiropractors, psychologists, and clergy. She was put into a mental institution based on a vast array of physical and emotional problems. None of these problems were present before her fillings were placed, or after they were removed. Because it is common to refer patients like her with multifocal problems defying diagnosis to a psychiatrist or psychologist, it is important that professionals in these fields become more aware of the possibility of mercury toxicity.

Hume Hall, Ross (1987). Why The EPA Won't Work. Probe Post, Volume 10, No. 1, pp 29 - 31; Spring, 1987.

The author is of the opinion that the 1987 Environmental Protection Act (EPA) will be ineffectual. He feels that the Act is flawed because it is preoccupied with an outmoded, single chemical approach to dealing with toxic chemicals which focusses on deciding on each one's level of toxicity rather than the design of new policies to keep all chemicals out of the environment. This approach results in a very cumbersome, slow process which, he feels, does not keep up with the pace of technology. A second difficulty which Hall feels dooms the EPA is Environment Canada's relatively low position in the heirarchy of importance of government departments, a status which necessitated its liaison with a relatively stronger department, Health and Welfare, in order to pass the EPA. He claims that Health and Welfare lacks the motivation, expertise, and incentive to explore the broad questions of harmful effects of environmental toxicity. The initiative for a comprehensive approach to environmental cleanup and protection has to come from nongovernmental groups and provincial and municipal agencies, he feels.

Humiston, Karl (1987). Letter from Karl E. Humiston, M.D. Personal Correspondence, Karl H. Humiston, New York, NY; July 6, 1987..

The author, a physician practising environmental medicine for the last decade, notes that he has seen patients decline in health while practising avoidance so strict that it occupied their whole energy and attention. He concludes from personal experience that high-energy places, people and activities can strengthen one's immune system, and found that if he and his wife are reasonably attentive to environmental factors and select what they involve themselves in, New York is a healthy place for them to live. He now advises ecology patients that seeking positive influences is just as important as avoiding negative ones. This includes good family and spiritual life, food, clothing, housing, reading, music art, and socializing. Money makes a difference, but is not as important as the spirit of seeking. He instructs patients not to let ecological illness stop them from living their lives.

Hutchinson, Peggy; Lord, John; Osborne, Way, Lynn (1986). Participating With People Who Have Directly Experienced the Mental Health System. Canadian Mental Health Association; November, 1986.

The hopes of people disabled by mental health problems are not unlike those of other Canadians. Their use of formal mental health services does not mean that other things in life, like making a contribution to family, friends, work and neighbourhood, are any less important. In essence, participation is about involving and supporting individuals with a disability to be part of the everyday things which many of us take for granted. To achieve the quality of life which we all desire, the lives of individuals who have experienced the mental health system must be more fully experienced in the community. Only as participants in this sphere of human activity will they achieve real citizenship status. This report deals with the issues arising from community participation of the mentally disabled, presenting barriers and illustrations from experiences across the country.

Hutchison, Peggy; Lord, John; Savage, Harvey; Schnarr, Anne (1985). Listening to the People Who Have Directly Experienced the Mental Health System: Building a Framework for Support. Canadian Mental Health Association; August, 1985.

This study presents a consumer perspective on the mental health system using the words and stories of those who have experienced it. Feelings of cynicism and powerlessness result from the overwhelming paternalism directed towards these clients of the system. Most of those interviewed expressed deep concern that traditional psychiatric labels make it almost impossible for them to be seen as human beings. These people express a desire for independence but also require a great deal of support to become re-integrated into community life. They may periodically need some form of shelter or refuge but they believe the imposing controls and practices of institutions and hospitals are generally an inappropriate intervention. The rehabilitation and welfare systems tend to trap many into a life of poverty and dependence which result in feelings of low self-worth. Lack of appropriate housing conditions and work opportunities contribute to lack of dignity, income, and security.

Hutchison, P.A. (1986). Health Care for Canadian Native People. Can Med Assoc J, Vol. 134, pp 305, 308; February, 1986.

> The Regina Health Department has as permanent staff two native community health care workers who had initially trained under the Medical Services Branch of the Department of National Health and Welfare in addition to two other native health workers. The program's aim is to hire native health care workers, to motivate native people to avail themselves of the department's programs and to adopt healthy lifestyles, and to facilitate liaison with the native community and organizations. Evaluation is difficult, but some native people with health problems have been reached, there have positive results from immunization, and medical problems have been recognized and corrected.

Ibsen, Karsten Kaas; Valbjorn, Ole; Nielsen, Aksel (1981). The Indoor Environment and Symptoms of Disease. Assessment of the Conditions in Schools in Copenhagen. Ugeskrift For Laeger, No. 143, pp. 1919-1923; July 1981.

> A comparison was made between the incidence of disease and symptoms and the design of schools, with particular attention to the age of the buildings, flooring and ventilation systems. The registration of conditions of health in 14,561 pupils in 88 schools made by the school health services and a questionnaire involving 1226 pupils in 14 schools in Copenhagen were used. Significantly more numerous cases of allergy (asthma and hay-fever) were found in schools with textiles as floor coverings and significantly more numerous cases of skin conditions in the schools which were less than five years old or which had been renovated within the past five years. 31% of the pupils and 40% of the teaching staff stated that they took headache medicine at least once per month. Under one third of these pupils and over half of these teachers took headache medicine at least once weekly. By comparison between data obtained in the indoor environmental investigation and the registrations made by school health services, it was found that pupils stated higher incidences than those registered by the health services people. More than one third of the pupils participating in the indoor environment investigation had complaints which they attributed to the indoor environment. The majority had complaints concerning heat and noise. In schools with textile floor coverings, static electricity was the most widespread inconvenience as 60% complained about this as compared with 5% in the remaining schools.

Illich, Ivan (1976). The Age of Disabling Professions. Health Promotion Through Designed Environments, pp 5 - 26; Health and Welfare Canada, Health Programs Branch; October, 1976.

> A radical departure is necessary from a world of disabling professions to a world in which health is deinstitutionalized and personalized in such a manner that the individual may begin to assume personal responsibility for his or her health, with little or no assistance from the

health institutions or the various health professions. Specialist power to define issues in terms of problems creates problems. Medicine tends to engender helplessness and disease simply by taking out of the environment the opportunities for coping which constitute health. Our major institutions have acquired the uncanny power to remove society consistently from those same purposes for which they orginally had been engineered and financed. Thousands of small groups are at present challenging professional dominance over themselves and over the socio-technical conditions in which they live.

Imbus, Harold R. (1982). Acute Effects of Exposure to Formaldehyde. Presented at the Conference: "Formaldehyde..the Facts", Toronto Canada, May 1 1982.

Formaldehyde can result whenever there is combustion and enters the air from auto exhaust, fuel burning, photoxidation reactions, cigarette smoking. Consumer products that also contain formaldehyde are fabrics and paper products as well as a wide range of building materials. It is an irritant and a sensitizer, the latter meaning that it is capable of producing allergic sensitization - a specific immune response in an individual who becomes allergic to a substance. A number of organs can be affected by formaldehyde, primarily the skin, eye, upper and lower respiratory tracts, and the gastrointestinal system.

Ingraham, Leon (1983). Electromagnetic Radiation and Student Off-Task Behavior. Alberta Education, Planning Services Branch; July 1983.

The effects of electromagnetic radiation emitted from fluorescent lights on the off-task behaviours of grade three school pupils was studied. The independent variable was the level of electromagnetic radiation which was eliminated by grounding and shielding the fluorescent light fixtures in the experimental classroom. The off-task behaviours were recorded by a reliable on-sight observer for two groups of pupils. For the intact classroom group) comprised of all pupils and heterogenous with respect to hyperactivity) the elimination of electromagnetic radiation decreased significantly the rate of off-task behaviours. For triad groups (groups of three pupils selected as being most "hyperactive) the results were mixed and inconclusive. Contrary to expectations, pupils from this latter group who were prone to hyperactivity, demonstrated no benefit from the elimination of electromagnetic radiation. Further studies are suggested.

Innes de Neufville, Judith (1981). Social Indicators of Basic Human Needs: Quantitative Data for Human Rights Policy. Institute of Urban and Regional Development, University of California, Berkeley CA; May, 1981.

Among the internationally recognized human rights are a series which deal with basic human needs — education, health, nutrition and income, and the right to an adequate standard of living. Discrimination against women in these areas is also of prime importance. U.S. human rights policy has not generally taken these into account. If international policies are to encourage, assist, or pressure nations to achieve basic human needs, some definition and measurement of existing levels of need is essential. These social indicators are required if human rights policy on basic needs is to be implemented.

Innes de Neufville, Judith (1985). Knowledge and Action: Making the Link. Institute of Urban and Regional Development, University of California, Berkeley CA; November, 1985.

Central to the idea of planning is the systematic use of information to help shape decisions. In practice, however, though data are plentiful, the lament is all too familiar that a decision was made with inadequate information. This paper argues that much of the problem lies in the fact that explicit prescriptions about how to link knowledge to action are hampered by implicit assumptions about the nature of knowledge. These assumptions place a distance between knowledge providers and users and define knowledge as consisting of abstract principles and measurable facts. Knowledge could, instead, be defined as including a recognizable social reality and assumes researchers cannot be simply detached observers. Planners must embrace rather than deny ambiguity and uncertainty. Information can reduce uncertainty, but not impose certainty. Public debate over data can provide one acceptable way to decide how to handle ambiguity and risk.

Insel, Paul M. (1983a). Environmental Variables and the Prevention of Mental Illness. Lexington Books, 1983.

Mental health services cannot adequately respond to the needs of citizens unless those involved in the planning, organization, and delivery fully recognize the harmful effect that a variety of social, environmental, physical, psychological and biological factors can have. This book provides a thorough summary of the literature about environmental variables and their effects on behaviour. Extensive bibliographic references are included.

Insel, Paul M. (1983b). Social Climate of Mental Health. Environmental Variables and the Prevention of Mental Illness, chapter 2, pp 9 - 26; Lexington Books; 1983.

From the social-ecological perspective, mental health is intimately linked to the social environment so that in order to prevent mental illness, one must understand and assess the social environment. The probability of achieving an optimum environment is increased when planning of the environment is conducted by those who must function within the environment. Since it is the perceived climate that has the most important effect, perceptions appear to be more valuable than objective assessments of an environment by outside planners. Involvement in planning one's own environment is vital to self-esteem and good mental health. Many investigators have suggested that humans have an active need for control over their own environment. Participatory planning and the use of systematic assessment can fulfill this human need while developing competence in individuals to change and control their own environments.

Irwin, John (1987). The Liberation of Males. Presented at 1987 International Men's Leaders' Conference, Hebron, Connecticut, USA; October 23-25, 1987.

The author describes in detail how male stereotyping has led men to take an oppressor role against women (sexism), forcing women into unhealthy situations. The dehumanization of men, particularly being treated as an expendable economic and military resource, has also led to unhealthy situations for men in our society. The threat of being called 'gay' or 'not manly' is used, from an early age, to enforce male stereotyping (e.g. to be strong, aggressive, violent, unfeeling, sexually compulsive, oppressive to others, and less able to establish close relationships than women). The author sees the elimination of male stereotyping as a process which must proceed in parallel with the elimination of sexist behaviour (oppression of women by men), for either process to be successful.

Ishikawa, Satoshi; Miyata, Mikio; Okuwaki, Kenichi; Namba, Tatsuto; Fukushima, Kazuya (1986). Analysis of HLA Antigens in Behcet's Disease - A Possible Implication of Environmental Chemicals. Clinical Ecology, Vol. IV, No. 2, pp. 81-87; 1986.

Environmental chemical exposure was postulated as a possible cause of Behcet's disease, a mucocutaneous-ocular syndrome leading to blindness, ulcers, and sometimes death. Most of the patients studied had a history of contamination with organochlorine compounds and/or organophosphorus pesticides. The number of patients in Japan with this disease declined following the banning of certain strong toxic chemicals, including DDT, BHC (benzene hexachloride) and parathion, with some time lag. The researchers postulated that Behcet's disease may be caused by environmental chemicals, which may cause supersensitivity of the tissues, possibly leading to abnormality in the immune system.

Israelson, David (1987). Federal Department Fails to Back Report on Lakes Pollution. Toronto Star, December 1, 1987.

Federal researchers Tom Muir and Anne Sudar are reported to have authored a report which states there is strong evidence to link Great Lakes pollution with health problems such as cancer and birth defects. Cancer rates and rates of birth defects were found to increase from west to east along the lakes, and are heaviest near highly-contaminated sections such as the Niagara and St. Lawrence Rivers. People living along the lakes suffer higher rates of heart disease and strokes than other Canadians. The article also reported that the Federal Government will begin a followup in early 1988, and report on health effects of Great Lakes pollution in 1989.

Iyer, E.M.; Dikshit, M.B.; Suryanarayana, S. (1985). Effect of Exposure to Heat, Hypoxia, Cold, Acceleration, and Vibration Stress on the Total Blood Sulfydryl Groups in Human Subjects. Aviation, Space, and Environmental Medicine, pp 1097 - 1101; November, 1985.

The percent utilization of total blood sulfhydryl (bl-SH) group was assessed in 100 healthy, unacclimated male Indian Air Force personnel who participated in various stress trials which included heat, cold pressor test, hypoxia, 70 degree head-up tilt, acceleration, and vibration. Exposure to a hot and dry environment for a period of 50 minutes showed 49.7% fall, while exposure to a hot and wet environment showed a greater fall of 61%. Hand immersion for 2 minutes in water at 4 degrees C showed a 42.7% fall. Acceleration stress showed a highly significant fall and low frequency sinusoidal vibration produced a 42.7% rise.

Izumi, K. (1968). Psycho-Social Considerations of Environmental Design. National Society of Interior Designers, Interior Environment Research Council, 315 East 62nd St., New York NY 10021; May 1968.

Keywords: environmental design;

JML (1987). The Ethics of Paternalism in Public Health. Canadian Journal of Public Health, Vol. 78, Jan./Feb. 1987; pp 3 - 4.

Those who practice public health believe implicitly that they know best what is in the public interest. This is an attitude which others might describe as paternalistic or gratuitous interference in other people's lives. Situations such as occur when parents' religious or philosophic beliefs prevent their children from having blood tranfusions or being immunized are discussed. Efforts to control tobacco smoking and provide sex education to children also create awkward ethical questions. There should be a formal debate about these issues.

Jacko, M.G.; Ducharme, R.T. (1973). Brake Emissions: Emission Measurements from Brake & Clutch Linings From Selected Mobile Sources: Final Report. Environmental Protection Agency, Office of Air and Water Programs, Ann Arbor MI 48105; March 1973.

In order to define the extent of gas and particulate emissions from automotive brakes and clutches, a combination separation and storage collection system was devised. Unique emissions collectors for both disc and drum brakes and for a clutch were designed and built as the main embodiment of this instrumentation. The hardware was installed on a vehicle which was then driven through various test cycles to determine extent and type of brake emissions generated at low and high operating temperatures. The particulates were processed and analyzed by a combination of optical and electron miscroscopy to ascertain the asbestos content and the particle size distribution. On the average, more than 99.7 percent of the asbestos is converted; the contribution to the atmosphere is 5060 pounds, or 3.2 percent of the total asbestos emissions.

Jaeger, R.J. (1981). Carbon Monoxide in Houses and Vehicles. Bull. N.Y. Acad. Med., Vol. 57, No. 10, pp. 860-872; December 1981.

> Carbon monoxide is a common indoor air pollutant whose major toxic action from a public health standpoint appears to be associated with very subtle changes in neonatal growth, learning, and activity when low to moderate concentrations are tested. Such concentrations might occur after cigarette smoking or from living in poorly ventilated homes that use gas stoves for heating. Utilization of unvented internal combustion engines indoors should be discouraged, as should smoking. Carbon monoxide levels in blood range from less than 1% in nonsmokers to 5 to 10% in smokers. In fetuses of smoking mothers, as much as 7.6% of CO-HB was reported.

Jaffe, Louis S. (1967). The Biological Effects of Ozone on Man and Animals. American Industrial Hygiene Assoc. Journal, pp. 267-277; May-June 1967.

> Keywords: ozone; health effects;

Jaffe, Peter; Wolfe, David A.; Wilson, Susan; Zak, Lydia (1986). Emotional and Physical Health Problems of Battered Women. Can. J. Psychiatry, Vol. 31, October 1986; pp 625-629.

> The study focused on the emotional and physical health problems of battered women by comparing a sample of residents in shelters with a group of women in the community matched for family income, length of marriage, and number of children on the General Health Questionnaire. The results indicated that battered women report a significantly higher level of somatic complaints, anxiety, and depression. These effects tended to be associated with other life stressors and children with serious behaviour problems. The findings suggest that battered women represent a population that is at an elevated risk of developing pronounced mental health problems. The implications of the study are discussed in terms of assessing the needs of battered women and their children as well as being vigilant for family violence as an etiological factor for other problems. Future research with larger samples of women and children, as well as longitudinal studies to investigate changes in adult and child adjustment over time, is necessary to provide data that goes beyond these findings.

Jammet, H.; Bosnjakovic, B.F.M.; Czerski, P.; (1985). Occupational Hazards From Non-Ionizing Radiation. Occupational Safety and Health Series No. 53, International Labour Office, Geneva, Switzerland;.

This review provides an overview of the non-ionizing radiation field, including biological effects from extremely low-frequency fields (0-300 Hz). The Committee concluded that no specific pathology was found to be associated with exposure to electric fields around transmission lines, and that no significant health risks were identified on the basis of epidemiological studies of workers occupationally exposed to extremely low frequency radiation and power frequencies (50 Hz and 60 Hz).

They note that a low-frequency electric field does not penetrate the human body to any significant extent, in contrast to a magnetic field, and that there are no known specific symptoms for ELF electromagnetic field effects. With strong alternating electric fields three interactions occur:

a) Small currents flow within the body due to the capacitive coupling to the field.

b) Spark discharges occur when objects of significantly different potential are contacted.

c) Large surface fields occur, particularly at sharply curved surfaces, and these local fields may produce superficial sensations of the field.

The magnitude of the internal currents is small in comparison with that of the currents that flow when contact is made with charged conductors. The internal electric field associated with the small currents is approximately one million times smaller than the applied external electric field. Magnetic ELF fields induce eddy currents in the body, that may produce heating. A magnetic field corresponding to a 10 kV/m electric field could induce a voltage of 1 mV in humans. The authors note that this is a small value with respect to the voltages needed to cause biological effects, and that only with field intensities of some tens of milli-Teslas (about ten thousand times that associated with power lines) have specific effects been reported.

There is some evidence that the nervous system may be affected by ELF electric fields that are far too weak to have a direct effect on brain synaptic function or membrane excitability through field influence on ionic motion through the cell membrane. Animal studies have also shown effects on calcium exchange from various brain tissues. The authors conclude, however, that none of the evidence indicates that even strong electric fields have effects that 'compromise man's ability to function or have long-lasting or permanent effects on neuro-physiological health.'

Jarvis, Bruce B. (1986). Potential Indoor Air Pollution Problems Associated with Macrocyclic Trichothecene-Producing Fungi. Significance of Fungi in Indoor Air, Part II, Working Papers; Health and Welfare Canada Working Group on Fungi and Indoor Air; March, 1986.

> Four genera of fungi have been reported to be producers of macrocyclic trichothecene toxins. A case study is presented which describes a family living in a brick house in Chicago. They had been, over the course of a 5 year period, subject to a variety of recurring maladies including cold and flu symptoms, sore throats, diarrhea, headaches, fatigue, dermatitis, and generalized malaise. The father experienced severe leg pains and the family was highly stressed. Air sampling indicated the presence of numerous fungal spores. This, and the family's symptoms, indicated testing for trichothecenes; testing proved positive. Building materials of high cellulose and low nitrogen content that become moist and are subjected to temperature fluctuations can provide ideal growth conditions for fungi production, specifically S. atra. The symptoms exhibited by the occupants of the Chicago house are consistent with those reported to result from macrocyclic trichothecene toxins. The trichothecenes are also immunosuppressive agents, a role that is often overlooked.

Johnson, Byron (1983). Evacuation Techniques for Disabled Persons. National Research Council of Canada; March, 1983.

> This is a study of techniques of preparing, lifting, and carrying persons with various disabilities in emergency evacuations of buildings. It is difficult for untrained rescuers to motivate certain people to evacuate. The tests with semi-ambulant persons showed that those who need assistance in a fire or other emergency were able to judge their needs quite well and may move quicker when aided, although persons prone to spasticity can move more surely with assistance. Without special planning, it is unlikely that non-ambulant disabled persons can participate in a total building evacuation.

Johnson, Kirk A.; Batts Young, Bambi (1982). Environmental Agents and Behavioral Aberration: A Neglected Public Health Dilemma. Center for Science in the Public Interest, Environment and Behavior Program, Washington DC 20009.

> This paper gives a brief review of some of the pesticides, heavy metals, pollutants, foods, food additives, and drugs that have been linked with unexpected behavioral disturbances, including paranoia, hyperactivity, anxiety, and hallucinations. Unfortunately, high rates of misdiagnosis indicate that many health professionals are unaware that behavioral aberrations in a patient might be caused by exposure to such environmental factors. Many health professionals tend to attribute patients' complaints to mental illness, stress, or other non-physical agents. The authors find a clear need for more controlled, double-blind studies

of behavioral toxins. Federal regulatory agencies could provide a major impetus for such research by requiring that new and existing chemicals be tested for behavioral effects, and by considering behavioral effects when setting health and safety standards.

Johnson-Lussenburg, C.M. (1986). Viruses in Air and Their Potential for Infectivity as well as the Presence and Importance of Endotoxins and Legionella in Indoor Air: prepared December, 1985. Significance of Fungi in Indoor Air, Part II, Working Papers; Health and Welfare Canada Working Group on Fungi and Indoor Air; March, 1986.

Certain viral infections may be transmitted indoors by the airborne route. The relative importance of airborne transmission in the spread of infections in comparison to other routes depends on the nature of the virus, the susceptibility of the host and the influence of the indoor environment. Although increased respiratory infections have been correlated with exposure to certain pollutants, the effect of those pollutants on the host susceptibility is difficult to evaluate. It is also difficult to identify the etiological agents involved in these infections and to determine whether the severity of the infection is a property of the infecting agent or a consequence of increased susceptibility of the host. An extensive bibliography is included.

Johnston, Anne (1983). Hazardous Substances & the Right to Know: The Public Health Perspective. Board of Health for the City of Toronto; October 1983.

This presentation discusses the various immediate and long-term health problems resulting from both low and high level exposures to a variety of toxic substances. It is pointed out that it is essential that hazards be anticipated and averted and that exposure be reduced or eliminated. We can best protect ourselves if we know where the toxic substances are located, therefore so-called "right-to-know" legislation is imperative.

Jonassen, Niels (1981). Radon Exhaling Properties of Building Materials. Presented at the 1981/2nd/European Conference on Building Materials, April 1981, Glasgow Scotland.

Keywords: radon; health hazards; building materials;

Kagawa, Jun; Toyama, Toshio (1975). Photochemical Air Pollution: Its Effects on Respiratory Function of Elementary School Children. Archives of Environmental Health, Vol. 30, pp. 117-122; March 1975.

The effects of photochemical air pollution on respiratory function of Tokyo elementary school children were investigated. Nine types of environmental factors were continuously recorded. Seven categories of respiratory function tests were performed on 20 normal 11-year old children once a week from June to December 1972, as a general rule. The correlation coefficients between respiratory function measurements and each of the environmental factors were calculated. The maximum expiratory flow rate (V max) showed high correlation with the largest number of environmental factors. Among environmental factors, temperature highly affected various respiratory function tests. The ozone was significantly associated with airway resistance (Raw) or specific airway conductance (Gaw/Vtg), N0 or N0 2 with V max, and temperature with Raw, Gaw/Vtg, and V max. Two subjects among all subjects were considered as the reactors to the environmental factors.

Kagawa, J.; Tsuru, K.; Doi, T.; Tsunoda, T.; Toyama, T.; Nakaza, M. (1980). Lung Function Studies on Intermittently Exercising High School Students Exposed to Air Pollution. Nitorgen Oxides and Their Effects on Health; pp. 333-342; Lee, S.D., editor; Ann Arbor Science Publishers Inc.; 1980.

The acute effects of air pollution on the lung function of 9 high school students with two hours intermittent exercise were investigated during 2 consecutive 5-day periods. Multiple regression analysis was performed for each subject, utilizing each lung function test as the dependent variable and each environmental factor as the independent variable. The evaluation of the square of the multiple correlation coefficient suggests that the significant contributions of the environmental factors to the total variance of lung function were seen in about half the subjects.

Kahn, Robert; Hein, Karen; House, James; Kasl, Stanislav; McLean, Alan (1983). Report on Stress in Organizational Settings: Analysis and Implications of Research/A Study by the Institute of Medicine, National Academy of Sciences. Stress and Human Health; chapter 5, pp 81; Elliott, Glen R.; Eisdorfer, Carl ed; Springer Publishing Company, New York; 1983.

Stress associated with organizational settings, such as work or school, constitutes a major part of the total stress experienced in people's lives. Organizational settings also are likely sources of stress because they provide the main context in which society makes demands on people to perform and to relate to a broad range of others in specified ways. But because organizations are ready-made mechanisms of social influences, power, and communication, they can and should be utilized in any large-scale effort to reduce stress or improve health.

Kailin, Eloise W.; Brooks, Clifton R. (1963). Systemic Toxic Reactions to Soft Plastic Food Containers. Medical Annals of the District of Columbia; Vol. XXXII, No. 1, pp 1 - 8; January, 1963.

Three patients with intolerance to multiple chemical factors in the environment are described. Double-blind testing established beyond reasonable doubt that certain persons react systemically and adversely to some factor which passes into food or water from ordinary polyethylene food containers.

Kailin, Eloise W.; Hastings, Alicia (1966). Cerebral Disturbances from Small Amounts of DDT: A Controlled Study. Medical Annals of the District of Columbia, Vol. 35, No. 10, pp 519 - 524; October, 1966.

> Crystalline DDT dissolved in food oil at from 10 to 10,000 ppm when held 1 to 2 inches under the nostrils of highly sensitive subjects elicited in a few minutes visual disturbances, headache, weakness, perceptual abnormalities, and slowed mental and motor activities.

Kalnins, R.; and Gaudert, P.C. (1985). Formaldehyde Emissions from Typical ParticleBoard Applications and Assessment of Specific Abatement Measures: Sponsored by Air Pollution Control Association TT-7 Indoor Air Quality Committee, Health and Welfare Canada, National Research Council of Canada, Public Works Canada, Consumer and Corporate Affairs Canada, and Canada Mortgage and Housing Corporation. Presented at the International Speciality Conference on Indoor Air Quality in Cold Climates: Hazards and Abatement Measures; Ottawa, Ontario, April 29, 30 and May 1, 1985.

> Formaldehyde emissions emanating from building materials made with formaldehyde-based resin binders have caused much concern to health authorites, government regulatory agencies, and affected homeowners. In particular, certain urea formaldehyde (UF) resin-bonded particle boards tend to have high emission potential because of the inherent hydrolytical instability of such resins. In modern home construction such board is used extensively in the built-in furniture and shelving in the kitchen, bathrooms, and closets. In some cases UF-bonded particleboard is also applied in the floor construction. Additional amounts of such board are introduced into the finished dwellings by furniture. A preliminary investigation in a senior citizens apartment indicated that installed particleboard was the major cause of the unacceptable formaldehyde levels. Concentrations in the air ranged from 0.2 to 0.8 ppm in the upper floor apartments, built with particleboard floor underlay. The present recommended limit is 0.1 ppm.

Kalymun, Mary; Combs, E. Radene; Hanzal-Kashi, Amy; Wilde, Vicki L.; Glunt, Eric K.; Welch, Polly; Robinson, John Deschamps (1985). Person/Environment Relationships and the Well-Being of Older Adults. Environmental Change/Social Change; EDRA 16; pp 354; Environmental Design Research Association; 1985.

> As personal resources diminish, as often happens with aging, it appears critical that individual needs and environmental characteristics complement one another in order to maintain independence and personal control in one's life. One ecological perspective suggests that the goodness of fit that exists between the individual needs and preferences of older adults and environmental characteristics is preliminary to well-being. Both constituents must be considered simultaneously, as parallels, in examining the congruence between older adults and their residential settings. If environmental characteristics in residential settings

restrict behavior, elderly people are less likely to exercise control and independence. This situation is exacerbated by the limitations of space, physical design, and options to choose and maintain living arrangements that meet personal needs.

Kaminoff, Robert D.; Proshansky, Harold M. (1981). Stress as a Consequence of the Urban Built Environment. to appear in L. Goldberger & S. Breznitz, Handbook of Stress; New York: Free Press-Macmillon (In press, 1981).

Stress is defined as that pattern of psychological, behavioral, and physiological responses of the individual to demands of the physical and social environment that exceed his capacity to cope effectively, that is, carry out activities, realize goals, and experience satisfactions. Lack of fit between the properties of the physical environment and the requirements of the person may induce stress in that person by creating demands that exceed his or her ability to cope and still pursue other goals in the setting. To the extent of this stress, the individual may be motivated to reduce the discrepancy between negatively perceived aspects of the environment and personal requirements, either by adaptation to the environment, or exertion of control over it. In the context of an urban existence in a built environment, the nature and intensity of environmental stimulation including its predictability and the extent to which it can be controlled assumes considerable importance. A literature review suggests many relationships between physical features of the built environment and stressful outcomes for inhabitants.

Kasuga, Hitoshi; Hasebe, Akihisa; Osaka, Fumio; Matsuki, Hideaki (1979). Respiratory Symptoms in School Children and the Role of Passive Smoking. Tokai J. Exp. Clin. Med., Vol. 4, No. 2, pp. 101-114; 1979.

A study of respiratory symptoms in 1,937 school children aged 6-11 years was carried out in Suginami, Tokyo and the response rate was 99.5%. The prevalence rate for symptoms was associated with their families' smoking habits and their residential conditions; the prevalence rate was the highest among heavy-smoker families living in the area along a main highway (within 50 meters), and the lowest in non-smoker families regardless of their residential areas. Furthermore, if they lived in an area well away from a main highway (over 100 meters), the prevalence rate was also the lowest regardless of the families' smoking habits. Relative risk in the highest group was 4.0. Previous studies have already suggested that there was a relationship between symptoms and passive smoking while some have insisted that there was no relationship between them. This study may be useful in solving such contradictory problems and in establishing the role of passive smoking in respiratory symptoms.

Kato, Terutaka; Kasuya, Minoru; Kagamimori, Sadanobu; Kozuka, Hiroshi; Hashimoto, Takejiro; Kawano, Shoichi (1981). Evaluation of Aerial Environmental Pollution by Means of Indicator Plants in a Slightly Polluted Area—Relationship Between the Vigor of Japanese Cedars and Prevalence of Respiratory Symptoms in School Children. Journal of Pharmacobio-dynamics, Vol. 4, No. 5, p. S-60; 1981.

> The effects of low grade air pollution on human health and vegetation were studied in a Japanese rural area by three approaches: a field survey for estimating the degree of injury to Japanese Cedars; a biochemical study to clarify the mechanisms of inhibition of tannin biosynthesis in the Cedars; an epidemiological study of respiratory symptoms in children.

Kaye, Herbert (1987). Clinical and Research Applications of Quantitative Electrophysiology. Quantified Signal Imaging Inc., North York, Ontario; 1987.

> A new computerized diagnostic system which provides physicians with a reliable and affordable window to the brain's electrical activity has recently been unveiled by an Ontario-based company. This advanced brain imaging system provides a high resolution colour image of the brain's electrical activity which accurately mirrors the brain's state of health. It can, both in the hospital clinic and clinical professional office, serve for assessing patients with head-trauma, substance abuse effects, cerebrovascular disease, stroke, epilepsy, genetic disorders, sensory-motor disabilities, diseases of the kidney and liver, and a variety of illnesses. Qualitative electrophysiological testing can also be used to evaluate persons who have been exposed to environmental chemicals at toxic levels. Such procedures have also provided support for the contention that there are specific changes in brain function that accompany cognitive or affective shifts in patients who are sensitive to exposure to common foods and odours.

Keating, John P. (1983). Environmental Stressors: Misplaced Emphasis. Stress and Anxiety, Chapter 3, pp 55 - 66; Sarason, Irwin G.; Spielberger, Charles D. ed; Hemisphere Publishing Corporation; 1983.

> Although environmental factors may contribute to stress, stress-related behaviour will always result from the person and that person's cognitive structure of the environment.

Keller, Martin D.; Lanese, Richard R.; Mitchell, Ralph L.; Cote, Roger W. (1979). Respiratory Illness in Houses Using Gas and Electricity for Cooking. Environmental Research, No. 19, pp. 495-503; 1979; Academic Press, Inc.

> Keywords: gas cooking appliances; indoor air pollution; respiratory illness; health hazards;

Kennedy, Donald A. (1977). Community Health and the Urban Environment: A Report of the Inter-University Board of Collaborators. The Effect of the Man-Made Environment on Health and Behavior, Chapter 2, pp 7 - 44; Centre for Disease Control, Public Health Service, U.S. Dept. of Health Education and Welfare, Atlanta GA; 1977; Hinkle, Lawrence E., Loring, William C., ed.

> American cities are unhealthy places in which to live, work, play, or visit. All persons using the city suffer to some degree from the noise, air pollution, traffic congestion, crowding and lack of open areas of trees, lakes, grass, and rivers. Each person brings to the city a certain set of vulnerabilities and handicaps. If his or her residential area has a high crime rate, the work situation has high levels of toxic chemical exposure, and his or her children are denied an adequate education due to racial discrimination, civil disorders and inadequate tax revenues, then he or she operates under a burden of stresses and potentially hazardous conditions that are likely to affect his or her level of health and longevity. Self-directed change is possible with the open collaboration of three groups: community developer/managers, community resident-clients, and health researchers. A comprehensive bibliography is included.

Kerr, H.D.; Kulle, T.J.; McIlhany, M.L.; Swidersky, P. (1975). Effects of Ozone on Pulmonary Function in Normal Subjects: An Environmental-Chamber Study. American Review of Respiratory Disease, Vol. 111, pp. 763-773; 1975.

> Keywords: ozone; pulmonary function; indoor air pollution; health hazards; NHW

Kerr, H.D.; Kulle, T.J.; McIlhany, M.L.; Swidersky, P. (1979). Effects of Nitrogen Dioxide on Pulmonary Function in Human Subjects: An Environmental Chamber Study. Environmental Research, No. 19, pp. 392-404; 1979; Academic Press.

> Keywords: nitrogen dioxide; pulmonary function; indoor air pollution; health hazards;

Kerrebijn, K.F.; Mourmans, A.R.M.; Biersteker, K. (1975). Study on the Relationship of Air Pollution to Respiratory Disease in Schoolchildren. Environmental Research, No. 10, pp. 14-28; 1975; Academic Press, Inc.

> Respiratory symptoms and ventilatory functions were measured in fourth and fifth grade school children living in two areas that differ in air pollution but are comparable with respect to social and demographic factors. Children living in the high polluted area showed a higher prevalence of cough during the day or at night, which is assumed to be due to the difference in pollution level. Mean ventilatory function in the children from both areas did not differ. In both areas mean PEFR (peak

expiratory flow rate) and mean FEV (forced expiratory volume) of children with symptoms were lower than in children without. Depending on the criteria used, prevalence figures for chronic respiratory disease ranged between 5.3-12.7% in the high polluted and 3.3-9.8% in the low polluted area.

Kershner, John R.; Morton, L.L. (1984). Negative Air Ionization Improves Memory and Attention in Learning-Disabled and Mentally Retarded Children. Journal of Abnormal Child Psychology, Vol. 12, No. 2, pp. 353-366; 1984.

The effect of increased concentrations of ambient negative air ions on incidental visual memory for words and purposive auditory memory was investigated in 20 normal grade 4 children, 8 learning-disabled children, and 8 mildly mentally retarded children. All of the children breathing negatively ionized air were superior in incidental memory. The action of negative ions on the neurotransmitter, serotonin, may be the mechanism by which negative ions produce such behavioural effects.

Kershner, John; Stansfield, Michael; Kershner, Barbara; Hadfield, Audrey (1985). Air Quality in the Classroom Affects Memory in Four Learning Impaired Children. OISE; 1985.

The air in a special education classroom was modified alternatively over a three month period so that every two weeks the children were breathing air with a high ambient concentration of negative air ions. Under double-blind conditions, the four learning impaired children in this class were assessed on measures of immediate, memory, letter naming, text copying, math, spelling and a parent-teacher questionnaire. When breathing negatively ionized air, in comparison to a placebo-air condition consisting of regular classroom air, all of the children, irrespective of their unique psychoeducational, characteristics, demonstrated a moderate improvement in short-term visual and auditory memory. One child showed a large improvement in classroom behaviour.

Kim, Yoon Shin; Spengler, John D.; Yanagisawa, Yukio (1985). NO2 Concentrations in Offices With Kerosene Space Heaters and Electric Stoves. Air Pollution Control Association, 1985.

As part of a study to evaluate the impacts of use of stove or heater on indoor NO2 concentrations, a pilot study on NO2 measurements in 20 offices was conducted using diffusion tube and filter badge personal samplers during January and February of 1984 in Seoul, Korea. Offices with kerosene space heaters had average NO2 levels approximately four times higher than the corresponding levels in offices with electric stoves. Average NO2 concentrations above 50 ppb of the Korea ambient NO2 standard were exceeded in approximately 71% of offices with kerosene heaters.

King, David S. (1981). Food and Chemical Sensitivities Can Produce Cognitive-Emotional Symptoms. Nutrition and Behavior; chapter 11; pp 119 - 130; Franklin Institute Press, Philadelphia PA; 1981; Miller, Sanford A., ed.

> Exposure to allergens and other environmental substances has been clinically reported to provoke cognitive, emotional, and behavioral reactions in sensitive individuals. Controlled experiments directly testing such observations are limited. However, several studies provide evidence consistent with the possibility of allergic exposure provoking psychological reactions, although alternative explanations are possible. One double-blind experiment has tested whether sublingual allergy testing could provoke cognitive-emotional symptoms. In this study, most of the 30 allergy outpatients were abnormal on at least one MMPI scale. Cognitive-emotional symptoms were reported significantly more often on allergen trials than on placebo trials, as were psychosomatic symptoms, but not somatic symptoms. Heart rate change variability was greater on allergen trials. A follow-up MMPI found a significant improvement on the MMPI overall. Future research is recommended and suggestions are included.

King, E. (1982). Lead Poisoning. Public Health Review, Vol. 10, No. 1, pp. 49-76; Technosdar Ltd.— International Scientific Publications; 1982.

> Despite the enormous research effort, as evidenced by the number of publications in recent years, there is still no clear understanding of the mechanism of lead poisoning or consensus of opinion as to the importance, or even existence in some cases, of the effects of lead below those of clinical lead poisoning. This article discusses how we have arrived at our present impasse in both the occupational and communal fields.

Kinney, Jennifer M.; Parris Stephens, Mary Ann; McNeer, Ann E.; Murphy, Michael R. (1985). Personalization of Private Spaces in Congregate Housing for Older People. Environmental Change/Social Change; EDRA 16; pp 184 - 188; Environmental Design Research Association; 1985.

> As older people move from homes in the community to congregate housing, the housing environment becomes the residents' microcommunity. Similarly residents' apartments in the facility may assume the role of the homes they left behind in the community. This relocation may be stressful for older people, in that they are leaving a familiar home environment and meaningful social ties. It has been suggested that bringing familiar possessions from a past home will facilitate adaptation to the facility. Personalization brings a sense of control, and reinforces self-identity while communicating values to others, enabling social ties to develop. This study examines how older residents of congregate housing feel about and personalize their apartments, and identifies demographic and health

variables influencing the amount and type of personalization in which they engaged. Analyses indicate the importance of environmental factors in making a place feel homelike. Health variables account for more variance than age and gender in the amount of functional and decorative possessions appearing in residents' rooms. Residents with more decorative possessions tend to be more satisfied with their apartments. Results from this research have implications for planners and designers of congregate housing for older people.

Kinsman, Gary (1987). The Regulation of Desire: Sexuality in Canada. Black Rose Books, New York, 1987.

The author notes that as of March 1987, Quebec, Ontario and the Yukon Territory are the only Canadian Jurisdictions to have added "sexual orientation" protection to their human rights codes. He notes that a number of municipalities have instituted limited forms of protection and many unions have won such protection in their contracts. At the same time, he emphasizes that even today, governments, social agencies, businesses, and landlords continue to deny lesbian and gay individuals basic civil and human rights.

Kirsh, Sharon (1983). Unemployment: Its Impact on Body and Soul: Questions and Answers Addressing the Human Costs of Unemployment. Canadian Mental Health Association; 1983.

Responses to losing a job follow a general grieving process made up of shock; optimism and attempts to find employment; pessimism, depression and anxiety; and fatalism, accompanied by low job-seeking, apathy/despair, then adaptation to a lower standard of living. Factors which moderate the effects of unemployment include the availability of social, physical, material, and psychological support and externalization of blame onto the economy and government leading to action for dealing with one's anger. There is little research into the impact of unemployment on women workers. The stress of unemployment can also cause family breakdown, contribute to child abuse and adolescent crime, and create school-related problems for children. Older workers who suffer unemployment are victimized by age discrimination. Mental hospital admission rates vary according to economic changes, however job availability for the chronic psychiatric patient presents a special set of problems including the stigma of mental illness, the effects of some medications, gaps in resumes, lack of work incentives, and an entrenched sheltered-workshop mentality.

There is little research into the connection between unemployment and physical health. But there is a causal connection between chronic stress and several infectious diseases, cancer, heart disease, stroke, and ulcers. In addition, people are more likely to use addictive substances like alcohol and tobacco during periods of unemployment. Economic in-

stability and poverty also create poor nutritional levels, and decreased ability to utilize medical care facilities. Primary prevention techniques in both the areas of mental and physical health as they relate to unemployment are discussed, and a comprehensive bibliography is presented.

Kittler, Fred J.; Baldwin, Deane G. (1970). The Role of Allergic Factors in the Child with Minimal Brain Dysfunction. Annals of Allergy, Vol. 28, pp. 203-206; May, 1970.

Formal elementary education finds many children with learning disabilities and behavior problems. Many manifest some combination of the signs and symptoms of the minimal brain dysfunction syndrome. Allergy of the tension-fatigue syndrome general classification is present in a significant percent of children with minimal brain dysfunction syndrome and the authors believe allergy causes them to have findings of this syndrome.

Kleiman, Cindy (1987). Allergic Students Will Soon Breathe More Easily. Toronto Star, North Section, October 6, 1987.

Students of the York Region Separate School Board who suffer from severe allergies or hypersusceptibility will be housed in two ecological classrooms designed with high efficiency air filters and a mimimum of synthetic materials. The classrooms are part of a two-part strategy to decrease the number of allergens in school buildings. New schools are being constructed with sensitivity to the average child's allergies.

Kon, S.H. (1978). Underestimation of Chronic Toxicities of Food Additives and Chemicals: The Bias of a Phantom Rule. Medical Hypotheses, No. 4, pp. 324-339; 1978.

Keywords: food additives; chemicals; toxicity;

Konopinski, Virgil J. (1983). Formaldehyde in Office and Commercial Environments. American Industrial Hygiene Association Journal, No. 44 No. 3, pp. 205- 208; March 1983.

Keywords: workers; office; formaldehyde; commercial buildings; indoor air pollution;

Korosec-Serfaty, Perla (1985). Experience and Use of the Dwelling. Home Environments, Human Behavior and Environment; Vol. 8; pp 65 - 86; Plenum Press New York; 1985; Altman, Irwin and Werner, Carol M., editors.

This study looks at how the relationship to home is experienced by the dweller, especially in relation to people's reactions to burglary as it ruptures the inside/outside boundaries created by one's home. In

this context, the author emphasizes the importance of comprehending the whole dwelling experience, including the modes of the relationships which are established within the home. Being burglarized is experienced as being defiled and causes a specific psychological impact on the person's relationships with others.

Kose, Satoshi; Naoi, Hideo; Uno, Hidetaka (1986). An In-depth Study of Accidental Injuries Associated With Building Features: Translating Research into Practice. CIB.86, Advancing Building Technology, Volume 7, pp 2877 - 2884; 1986.

A questionnaire survey was conducted on the incidence of building related accidents in dwellings. About a thousand questionnaire forms were received from the residents in the Tokyo metropolitan area, covering over 3,500 family members. The result was compared with other data. It is found that accident types with high injury rates are not necessarily the same as those leading to death; severity of injuries differs among age groups even for the same accident type. Some of the implications to the building characteristics, such as stair design, are discussed, in order to reduce the tragic outcome of domestic accidents.

Kose, Satoshi (1987). Survey of Domestic Stair Conditions and Safety in Japan. unpublished paper presented at EDRA-18, Ottawa Canada.

A mail questionnaire survey on the present conditions of domestic stair design and accident incidence on stairs was conducted for Japanese dwellings. Two hundred and twenty-eight samples were used for analysis. The results suggest that pitch of Japanese domestic stairs ranged between 45 and 55 degrees with very small tread goings, and they were not necessarily provided with handrails. Reported accident incidence among the samples was fairly low and it was difficult to pinpoint factors of design that determine the level of danger for any type of stairs. Further in-depth study on accidents is needed to reveal quantitative basis for safer stair design.

Kreiner, C. (1986). Address on Oppression of Working-Class Men. For Men, Number 11, pp. 4-5; London, England, Autumn 1986; Excerpts from an address to a Men's Workship in Yorkshire, England, 1985.

The author describes the exhaustion, poisoning, pollution, manipulation, physical exploitation of working conditions for many working class men in Western society. "We are told that endurance of this is manly - rather than be encouraged to reclaim our power to change the conditions. Miners', factory and chemical workers' conditions damage them physically, but they are taught to feel ashamed of protesting or saying 'this hurts' or 'this is not right' because these conditions are manly to endure."

Kreiss, K.; Gonzalez, M.G.; Conright, K.L.; Scheere, A.R. (1982). Respiratory Irritation Due to Carpet Shampoos: from Indoor Air Pollution; Spengler, John—editor; pp. 337-341. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

> Dried detergent residue left in carpets after they were shampooed with underdiluted carpet shampoo caused respiratory irritation among most employees in an office building and among all staff members and most children in a day-care centre. Symptoms included cough, dry throat, difficulty in breathing, nasal congestion, and headache. Eye irritation was also noted by day-care centre staff members. Symptoms persisted for many weeks until the carpets were wet extracted. The major ingredient of the three shampoo products implicated in these two outbreaks and in a third similar report is sodium dodecyl sulfate, a respiratory irritant in mice. Detergent dust is a newly recognized example of indoor air pollution and should be considered when patients or employees complain of building-specific respiratory or eye irritation.

Krieger, Martin H. (1970). Six Propositions on the Poor and Pollution. Policy Sciences, No. 1, pp 311 - 124; 1970.

> The effect of improving the environment may be greater inequities in our society. Current environmental programs maintain this inequity, proposed environmental programs may make things worse, and even if we do improve the environment, contentment may decrease. A political coalition of environmental and equity enthusiasts may provide a viable way out of these dilemmas.

Kruss, P.; Valeriote, LM. (1979). Fluoride: from Controversial Chemicals, A Citizens' Guide. Multiscience Publications Limited, Montreal Canada; 1979; pp 92-98.

> Industrial processes release fluoride into the environment, damaging plants and animals. There is a controversy over the fluoridation of drinking water and its effect on health. The chronic effect of long term exposure to fluoride has been blamed for an increased incidence of mongolism, a variety of symptoms such as headache, nausea and loss of weight, bone abnormalities such as osteosclerosis, and kidney and thyroid injury.

Kruss, P.; Valeriote, LM. (1979). Asbestos. from Controversial Chemicals, A Citizen's Guide; pp. 17-30; Multiscience Publications Ltd., Montreal PQ; 1979.

> Asbestos has long been known as a threat to health. It causes asbestosis—severe scarring of the lungs caused by continually inhaling asbestos over the course of many years. The symptoms begin with

shortness of breath, which develops into near paralysis that makes breathing and body movement increasingly difficult, leading to ultimate suffocation. It is now accepted that asbestos is also an agent for cancer of the abdomen, liver, gastro-intestinal tract and lung. The risk of lung cancer appears to be synergistic with smoking. It is widely used for filters in the chemical, food and beverage industries, resulting in asbestos fibres in most beers, wines and liquors, soft drinks, sugar and lard. It is also found in our drinking water.

Kruus, P.; Valeriote, I.M. (1979). Controversial Chemicals—a Citizen's Guide: Canada Science Series. Multiscience Publications Limited, 1253 McGill College, suite 175, Montreal Canada H3B 2Y5; 1979.

> 25 chemicals are listed in alphabetical order, a chapter devoted to each. Historical, technological, medical, economic and political backgrounds of these controversial chemicals are reported.

Kruus, P.; Valeriote, I.M. (1979). Lead: from Controversial Chemicals, A Citizen's Guide. Multiscience Publications Limited, Montreal Canada; 1979; pp. 128-136.

> Lead is used in gasoline additives, and is therefore an ever-present pollutant in urban areas. Leaded gasoline is the largest single source of gaseous atmospheric contamination. The Toronto Refiners and Smelters and Canada Metal Co. cases are cited. Health effects in humans and effects on wildlife and vegetation are discussed. Lead affects three systems in people: the nervous system, the kidney and red blood synthesis. Government regulation in Canada is described.

Kruus, P.; Valeriote, I.M. (1979). Sulphur Dioxide: from Controversial Chemicals, A Citizen's Guide. Multiscience Publications Limited, Montreal Canada; 1979; pp 190-195.

> Acidic precipitation is increasing due to the growing introduction of sulphur dioxide into the atmosphere. It has been linked with detrimental effects on fish, vegetation, buildings and people. Human health problems are related to irritation of the respiratory system.

Labelle, Huguette (1986). Nurses as a Social Force. Journal of Advanced Nursing, No. 11, pp. 247 - 253; 1986.

> Nurses in every continent engage in social action. This has been a fact throughout the ages. The major social issues which contribute to health today are economic, energy, environmental and social welfare problems. Other major issues affecting health are population growth, poverty, education, clean water supply, and family planning. The author shows how individual nurses and nurses' associations can, and should, exercise

their influence and power in promoting health at local, national, and international levels, making primary health care a priority. By using their levers of power, together with technology and communications, nurses can help create a new world health order.

Lachtman, Dennis S. (1980). Human Data Associated with Diesel Exhaust. from Health Effects of Diesel Engine Emissions, Vol. 2; pp. 1100-1113; Pepelko, W.E.; Donner, R.M.; Clarke, N.A., editors; November 1980.

A review of the literature concerning data relative to human exposures from diesel engines is presented. Epidemiologic evaluations among workers exposed to diesel exhaust are discussed. Morbidity and mortality data are critically reviewed. No conclusive evidence suggesting an association between diesel exhaust exposures and adverse long term health effects was found, but more studies involving humans evaluating health effects are needed. Those constituents found in diesel exhaust that are of primary health concern are oxides of nitrogen, particulates and sulphur oxides.

Laseter, John L.; DeLeon, Ildefonso R.; Rea, William J.; Butler, Joel R. (1983). Chlorinated Hydrocarbon Pesticides in Environmentally Sensitive Patients. Clinical Ecology, Vol. II, No. 1, pp. 3-12; Fall 1983.

The sensitive and selective analytical techniques of high-resolution gas chromatography and high-resolution gas chromatography-mass spectrometry were employed to characterize 16 different synthetic chlorinated hydrocarbon pesticides and common metabolites present in randomly selected environmentally sensitive patients. Of 200 patients initially screened, 99% had residues at or above the .05 ppb level in their sera.

Lassiter, Donald V.; Milby, Thomas H. (1978). Health Effects of Diesel Exhaust Emissions: A Comprehensive Literature Review, Evaluation and Research Gaps Analysis. Environmental Health Associates, Inc., 2150 Shattuck Ave., Berkeley CA 94704; January, 1978.

The purpose of the report was to provide a comprehensive literature review of the human health consequences of exposure to diesel exhaust emissions, especially as encountered in underground mines, and to define those gaps in current scientific knowledge which require further clarification through additional research. The toxicology of diesel exhaust both as a mixture and as individual toxicants was examined. In a properly ventilated mine, neither CO, SO2, nor NO2 were found to be major toxic problems. Polycyclic aromatic hydrocarbon (PAH) compounds were identified as the most potentially hazardous agents found in diesel engine exhaust. Although a properly maintained diesel engine would be likely to emit extremely small amounts of these agents, the possibility that they might be carcinogenic to humans singles them out for careful attention.

Last, John M. (1987). Scenarios and Methods to Support Long Term Health Planning: Conference Report. Canadian Journal of Public Health; Vol. 78, pp 11 - 12; January/ February, 1987.

> There is a great necessity and urgency for government involvement in long range health planning for maximum flexibility, based on changing demographics of population.

Laties, Victor G.; Beard, Rodney R.; Dinman, Bertram D.; Schulte, John H. (1969). Behavioural Aspects of Carbon Monoxide Poisoning. from Effects of Chronic Exposure to Low Levels of Carbon Monoxide on Human Health, Behaviour, and Performance; pp. 32-37; US National Research Council, Washington DC; 1969.

> It is apparent that there has been very little modern work on C0 and behavior. Most investigators have noted symptoms of C0 poisoning first when the level of C0 in the blood was raised to between 10% and 20% but many symptoms don't appear until the concentration of C0 in the blood increases beyond 25%. However, Schulte has shown positive correlations between C0 concentrations in the blood and performance decrement in a number of tests. For example, his subjects were required to do 50 arithmetic problems, each involving five five-digit numbers. They took about 13 minutes to complete the task under control conditions but about 17 minutes when their C0Hb level was 20% and made more errors under the latter conditions.

Laufer, Robert S.; Wolfe, Maxine (1977). Privacy as a Concept and a Social Issue: Multidimensional Developmental Theory. to be published in the Journal of Social Issues, Winter 1977/78.

> If we are to understand privacy as a future as well as a contemporary social issue, we must understand it as a concept. Individuals' concepts of privacy are tied to concrete situations in everyday life. These situations are described in terms of three dimensions: self-ego, environmental, and interpersonal. In combination with the dynamic of time, both developmental and sociohistorical, this analysis helps us to understand individual perceptions of privacy and privacy invasion, to predict potential privacy or invasion experiences, and to see the potential effects of the absence of certain privacy-related experiences.

Laurie, R. Dana; Boyes, William K.; Wessendarp, Thomas (1980). Behavioral Alterations Due to Diesel Exhaust Exposure. from Health Effects of Diesel Engine Emissions; pp. 698-712; Pepelko, W. E., Danner, R.M., Clarke, N.A., editors; US Environmental Protection Agency; November 1980.

> Several experiments examining the effects of diesel exhaust on the behavior of rats are reported. Animals were exposed either as adults or neonates. The spontaneous locomotor activity (SLA), measured in stan-

dard running wheel cages, of adult rats exposed for 8 hours per day, 7 days per week was significantly less than that of controls. Experiments involving diesel exhaust exposure to neonatal rats indicated that adult rats, exposed to diesel exhaust during their neonatal lives, were significantly less active as measured by SLA. Adult rats, exposed to 20 hours of diesel per day as neonates, were placed in skinner boxes after the SLA experiment described above had been completed. The exhaust exposed animals showed significantly decreased acquisition of a food reinforcing bar pressing task. All animals that learned this task extinguished at the same rate. The results of the neonatal diesel exhaust experiments support the hypotheses that diesel exhaust exposure during development of an organism can lead to behavioural differences in adulthood.

Laverne, Albert A. (1970). Air Pollution, Healing, and Civilization. Behavioral Neuropsychiatry, Vol. 2, No. 3,4; pp 26 - 38; 1970.

Medical evidence has shown that inhaled air pollutants can cause and aggravate respiratory diseases and can affect the brain and central nervous system, body defense mechanisms, and other vital organ systems. Air pollution also has a deleterious effect on overall work efficiency, intellectual and emotional functioning, and behaviour. There is even evidence that the healing processes may be substantially impaired, prolonged, or actually prevented by air pollutants. Double blind studies performed on both psychiatric and infectious disease patients appear to confirm these observations. In a group of 250 patients with acute and chronic psychiatric disorders, improvement was significantly greater when pollution-free air was administered immediately post-treatment. During the course of any disease, tissue resistance is lowered, and tissue susceptibility to toxins is increased.

Layton, Jack (1987). Healthy Toronto 2000: A Discussion Paper. Toronto Board of Health; August, 1987.

Health does not result simply from the actions of professionals in the health care system, but from a complex interplay of biological, psychological, social, environmental and political factors acting on the individual and family through the local community and through the whole human ecosystem. Health promotion and disease prevention are better than cures. A multi-sectoral approach is necessary. Social interventions for the common health are appropriate and may take precedence over individual concerns. Community development is the proper approach to many health problems. The vision presented in the report includes: appropriate technology in waste management, transportation, food production, energy use, and manufacturing process; quality food, shelter, work, safety and education with the emphasis on self reliance rather than dependence; integrated caring neighbourhoods, built to human scale; support services for those with special needs through a strong social support network; a wellness system rather than an illness system; and involvement of the whole community. Public participation is requested.

Lebowitz, M.D. (1983). Health Effects of Indoor Pollutants. Annual Review of Public Health, Vol. 4, pp. 203-221; 1983.

> Sources, concentrations, health risks and public health concerns associated with indoor pollutants are analyzed. Both outdoor and indoor sources of pollutants are responsible for indoor pollutant concentrations. The pollutants that are predominantly outdoors include sulfur oxides, ozone and related oxidants, most trace metals, halogen compounds, petrochemical compounds, pesticides, ultra-violet radiation, and pollen. Indoor-based pollutants include carbon monoxide, respirable particles, organic vapours, nitrogen dioxide, formaldehyde, radon, asbestos, mineral and synthetic fibers, carbon dioxide and viable organisms.

Lebowitz, M. (1986). Passive Smoking and Health Effects. Indoor Air, Vol. 6, 1986; Swedish Council for Building Research; Berglund, B.; Berglund, U.; Lindvall, T.; Sundell, J.; editors.

> The area of most difficulty in passive smoking is one of establishing exposure or dose. More research is required on statistical methods, and on measurement methods, methods of pulmonary function, more studies on chronic disease, and more research on carcinogens in smoke and lung cancer, especially on dose-response relationships to know of any association effects.

Lecuyer, Gerard; Aitken, Roy (1987). Report of the National Task Force on Environment and Economy. Canadian Council of Resource and Environment Ministers, Task Force on Environment and Economy; September, 1987.

> Complete integration of the economy and environment is possible and necesary. Long-term economic growth depends on a healthy environment and affects the environment in many ways. Ensuring environmentally sound and sustainable economic development requires the technology and wealth that is generated by continued economic growth. A new cooperative initiative is proposed to integrate economic and environmental planning through the participation and debate of senior decision makers at the provincial and federal levels. Also recommended is the development of conservation strategies as a valuable multisectoral approach to defining and implementing sustainable economic development. Public participation and improved environmental education are also recommended.

Lee, A. John (1987). Recognizing the Importance of Ethnicity for Canada's Elderly: Short Report. Canadian Journal of Public Health, Vol. 78, p. 6; January/February, 1987.

> It is imperative that our consideration of the health and social services and research on the needs of the elderly in Canada extend beyond the mainstream white middle class. Changing values, language capabilities and cultures exacerbate the already complex issue of aging.

Letourneau, E.G. (1985). Development of a Radon Standard for Canada. Air Pollution Control Association, 1985.

> The jurisdictional responsibility for natural radioactivity in Canada is divided between the federal and provincial governments. Over the years various standards for radon daughters in homes have been derived for special circumstances involving both radon arising from man-made contamination and natural occurence. Wide spread surveys have indicated that these initial standards were not appropriate for general use. The desire for uniform standards has resulted in the formation of a scientific group to advise a federal-provincial committee concerning the desirability of standards for exposure to natural radioactivity. The scientific committee could not agree either philosophically or practically on the control level for radon in homes. To resolve this impass, it undertook a calculation designed to illustrate for Canada, the potential cancers saved each year compared to the actual lung cancer rate, with an estimate of the cost, for each limit derived. A second calculation reviewed the cost of modifying the building code and estimated the long term effect comparing avoided cancers and cost.

Letz, Richard; Ware, James H.; Ferris, Benjamin G.; Spengler, John D. (1982). Pulmonary Functions of Children and Indoor NO2 Concentrations in Portage, Wisconsin: from Indoor Air Pollution: Proceedings of the International Symposium on Indoor Air Pollution, Health and Energy Conservation; Spengler, John—ed. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

> A study of NO2 concentrations inside 137 homes in Portage Wisconsin was made. An attempt was made to directly relate the observed lung functions of the children living in these homes to the observed NO2 concentrations. This was not found to be possible in this study. Several explanations are put forward: 1) NO2 may not be the offending agent. Gas stoves emit carbon monoxide, carbon dioxide, sulfur dioxide, nitrogen dioxide, formaldehyde, hydrogen cyanide, water vapour, carbon, and sulfate particles. 2) Perhaps only a sensitive sub-population is affected by the offending agent, and they may not have been well represented by this group. 3) Peak levels of NO2 may cause these health effects and long-term averages are poorly related to those peaks in this study. 4) Perhaps such a relationship exists and can only be detected by a much larger sample size.

Levi, Lennart; Frankenhaeuser, Marianne; Gardell; Bertil (1983). Report on Work Stress Related to Social Structures and Processes: Analysis and Implications of Research/A Study by the Institute of Medicine, National Academy of Sciences. Stress and Human Health; chapter 6, pp 119 - 146; Elliott, Glen R.; Eisdorfer, Carl ed; Springer Publishing Company, New York; 1983.

Important stressful psychosocial situations fall into four general categories: uprooting; dehumanization of society institutions; psychosocial side-effects of the spread of innovations; and psychosocial factors as constraints on environmental health programs and activities. A substantial body of indirect evidence strongly suggests that such social structures and processes affect the prevalence of ill health, lack of well-being, and low quality of life. Evidence suggests that the following interventions should be researched as means for reducing workplace-related stress: increasing a worker's control of work arrangements; providing mechanisms for worker participation in decision making on the organization of work; avoiding monotonous, machine-paced, and short but frequent work actions; optimizing automation; helping workers see their specific task in relation to the total product; avoiding qualitative work overload or underload; facilitating communication and support systems among work mates and others. A comprehensive bibliography is included.

Lewis, Beatrice E. (1985). The Stigmatized House. Environmental Change/Social Change; EDRA 16; pp 184 - 188; Environmental Design Research Association; 1985.

When a child with severe chronic mobility problems becomes too heavy or too cumbersome to lift and to carry, parents must consider removing architectural barriers in the home. Practical and psychological difficulties frequently cause them to postpone making such changes until a crisis occurs. Practical difficulties include lack of resources, gaps in services, and a general disregard by medical personnel of how environments affect behavior. Psychological difficulties, which has so far received little attention, mainly stem from conflict between the parents' desire for an idealized house and their child's functional requirements, as well as from the parents' desire to appear as normal to their neighbors. Adapting the home means accepting the permanence of the disability. It also means making the family's disability public — stigmatizing the house, and thus its occupants. These conclusions are based upon interviews with six families raising children who have severe mobility problems as well as upon residential histories taken from parents of these families and upon drawings of one's ideal home made separately by parents and by the disabled child.

Lewis, Myrna (1985). Older Women and Health: An Overview. Women and Health..the Journal of Women's Health Care; No. 2/3; pp 1 - 16; 1985.

Older women's health issues are unique. There are more older women than ever before. They are living increasingly longer than men, yet they report more acute and chronic illness and disability than men. They are disproportionally represented in nursing homes, since many women are alone: 25% aged 70 or over have no living children and over 60% of older women are widowed, divorced, or single. Older women have fewer personal financial resources for health care than men. They face age and sex discrimination on the part of many health care providers and are subject to a growing tendency to be seen as burdens and problems in the health care system.

Lidwell, O.M. (1979). Ventilation, Air Movement and the Spread of Bacteria in Buildings: from Indoor Climate: Effects on Human Comfort, Performance, and Health in Residential, Commercial, and Light-industry Buildings; Fanger, P.O. and Valbjorn, O.—editors; pp. 239-256. Danish Building Research Institute, Copenhagen Denmark; 1979.

Keywords: ventilation; bacteria; indoor air pollution; health hazards;

Lindstrom, Kari; Harkonen, Hannu; Hernberg, Sven (1976). Disturbances in Psychological Functions of Workers Occupationally Exposed to Styrene. Scand j work environ & health, No. 3, pp. 129-139; 1976.

Keywords: styrene exposure; polyester; psychological functions;

Liss, Gary M. (1987). Health Effects of Welding and Cutting Fumes and Gases. Occupational Health in Ontario, Vol. 8, No. 2, pp 69 - 78, Spring, 1987; Ontario Ministry of Labour, Occupational Health Branch, Toronto Canada.

The health effects, both acute and chronic, due to exposure to the products of welding and cutting processes are described. The welding process produces potential respiratory hazards with a particulate fraction, which is largely respirable metal oxide fume, and gases, of which ozone and oxides of nitrogen are the most dangerous. The welding environment may also contain contaminants that are extraneous to the welding process, such as gases and particulates. The available data do not permit the health effects to be correlated with cumulative duration of exposure, much less with levels of specific constituents that can be deemed safe or not safe, as they relate specifically to the welding environment. An extensive bibliography is included.

Lofgren, Inger (1981). Health and Safety in Buildings: R & D Programme, 1981-1984. Swedish National Council for Building Research.

This publication sets out the basis for the plan of action of the Swedish National Council for Building Research for the years 1981 to 1984. It notes that in order for further improvements in public health to be made, public health problems must be attacked by preventive measures such as identification of health hazards in the environment. Areas of concern are mould and other biological factors, thermal climate, radon, electromagnetic fields, air ions, lighting, noise, infrasound, vibration, chemical factors, addition and interaction effects, psychological effects, risk assessment, and epidemiological evaluations.

The research objectives of the group as stated are: to identify factors in buildings which may have a negative effect on the health of people; to analyze health hazards, taking into account biological effects, dose-effects and dose-response relationships, interactions, variations in the sensitivity of the population on exposure (with special reference to risk groups); and to develop appropriate technical and structural methods whereby health hazards can be reduced.

Lund, S.M.; Dowdle, E.B. (1977). The Effect of Prolonged Isolation from Environmental Allergens on the Clinical and Laboratory Manifestations of the Allergic State: Observation on Members of the South African Antarctic Expedition. SA Medical Journal, No. 52, pp. 556-561; September 24 1977.

Keywords: environmental allergens; treatment;

Lundqvist, G.R.; Iversen, Martin; Korsgaard, Jens (1982). Indoor Climate in Low-Ventilated Day-Care Institutions: from Indoor Air Pollution; Spengler, John—editor; pp. 139-142. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

Measurements of indoor atmospheric environment were carried out in a day nursery and a kindergarten, in which natural air infiltration supplied the rooms with only 1-2 m 3 fresh air per person and hour under the prescribed occupancy. The exposure situation from the field was duplicated under controlled conditions in a climate chamber. The results indicate unacceptably high concentrations of carbon dioxide, and emphasize the need for more elaborate building design in airtight buildings.

Lykke, A.W.J.; Stewart, B.W. (1977). Fibrosing Alveolitis (Pulmonary Interstitial Fibrosis) Evoked by Experimental Inhalation of Gasoline Vapours: Specialia. Experientia, Vol. 34, No. 4, p. 498; August 1977.

Keywords: gasoline vapours; health hazards; air pollution; lung function;

MacLeod, Kathryn E. (1981). Polychlorinated Biphenyls in Indoor Air. Environmental Science and Technology, Vol. 15, No. 8, pp. 926-928; May 1981; American Chemical Society.

PCBs have been recognized as environmental contaminants since the mid-60s. Until recently, however, little work has been done on identifying levels of PCBs in the indoor air. This paper describes a method for the analysis of PCBs utilizing low-volume indoor air sampling. The method uses polyurethane foam as a collector. This study shows that indoor air whether in commercial, industrial, or residential buildings, contains levels of PCBs at least 1 order of magnitude higher than outdoor levels. Defective fluorescent light ballasts are also shown to emit PCBs and to be an important source of indoor atmospheric contamination.

Maclennan, J.G. (1985). Hypersensitivity Reaction to Indoor Air Contamination in the Susceptible Individual. unpublished conference address.

> The response of any sensitive person to environmental incitants is not predictable, and will vary according to that individual's degree of sensitivity and their own physical peculiarities, physiologically and biochemically. Usually there is a multiorgan response in those who have exhibited chronic symptomatalogy for many years. Occasionally a sudden massive chemical exposure, or some other severe traumatic experience may release a reservoir of latent or hidden sensitivities. This frequently results in a cascade of severe varied symptomatology which occasionally is incapacitating and prevents the individual from functioning normally.
>
> There is no direct correlation between any particular exposure and a specific organ response. Frequently several organs may respond to a single environmental incitant. Successful ecologic management is based on an accurate diagnosis by establishing a cause and effect relationship between an environmental exposure and a symptomatic response. Then a program of avoidance, change in life style, and therapy as indicated, can be formulated.

Maclennan, John G. (1985). The Impact of Indoor Air Pollution on the Behaviour and Learning Ability of School Children: Sponsored by Air Pollution Control Association TT-7 Indoor Air Quality Committee, Health and Welfare Canada, National Research Council of Canada, Public Works Canada, Consumer and Corporate Affairs Canada, and Canada Mortgage and Housing Corporation. Presented at the International Speciality Conference on Indoor Air Quality in Cold Climates: Hazards and Abatement Measures; Ottawa, Ontario, April 29, 30 and May 1, 1985.

> The author states that increasing numbers of the Canadian population are inheriting the ability to acquire hypersensitivities to different environmental exposures. The commonest indoor contaminants found in school are particulate inhalants and chemical fumes, odours and smokes. There are also hazards for the food sensitive person, but these can usually be managed by ecological control of lunches and supervision by school personnel. Important chemical exposures are derived from tobacco smoke, perfume, fossil fuels and their derivatives, plant terpenes, photocopiers, duplicators, cleaning and maintenance materials, craft and other office and school supplies. In the majority of cases, the brain and central nervous system are the major areas of hypersensitive reaction which is reflected in the child's behaviour and ability to learn.

Macpherson, A.S. (1984). Letter to the Minister of Labour re Tobacco Smoke. City of Toronto Dept. of Public Health; December 1984.

> This is a letter recommending that the Minister of Labour make tobacco smoke a designated substance under the Occupational Health & Safety Act, and that a standard for tobacco smoke in the workplace be developed.

Macpherson, A.S. (1987). Environmental Health Effects of Waste Incineration in the City of Toronto. City of Toronto Department of Public Health; October, 1987.

> The environmental fate and persistence of potentially hazardous chemicals in waste incineration emissions as well as their potential health effects are reviewed in this report. It is difficult to determine the contribution of chemicals emitted from incinerators compared to other loadings to the ecosystem. Also, data on potential health effects of many chemicals are incomplete, particularly for long-term, low-level exposures. A risk assessment was undertaken to predict the degree of the hazard to human health resulting from the emissions from two sewage sludge incinerators. In addition, a risk assessment was conducted on a hypothetical solid waste incinerator equipped with the best available technology. The results showed that emissions from one incinerator do not pose any significant risks to human health, but that the emissions from the other do. Some of the emissions from the hypothetical incinerator could also pose significant risks to human health. Further research is needed. Technical and operational measures need to be implemented to reduce emissions of chemicals and questions need to be asked about siting of new incinerators and acceptable levels of health and environmental risk.

Mahaffey, Kathryn R.; Vanderveen, John E. (1979). Nutrient-Toxicant Interactions: Susceptible Populations. Environmental Health Perspectives, Vol. 29, pp. 81-87; 1979.

> Nutritional status can substantially modify the toxicity of environmental pollutants. Investigations with experimental animals and epidemiological observations on humans have established the role of nutrition in altering susceptibility to a variety of pollutants including pesticides and heavy metals. The degree of nutritional deficiency that alters susceptibility need not be severe. Frequently only biochemical indications of nutritional deficiency can be associated with changes in the dose-response of an animal or person to a toxic compound.

Makower, Joel (1981). Office Hazards: How Your Job Can Make You Sick. Tilden Press, 1737 DeSales St., NW, Washington DC 20036; 1981.

> Energy efficiency, design deficiencies, combined with hazardous working materials, have helped to make air pollution in offices a bigger health problem than air pollution outdoors. A list of contaminants is provided. Fluorescent light, video display terminals and other sources of radiation join stress as being some of the main offenders.

Makower, Joel (1981). There's Something in the Air. from Office Hazards, chapter 1, pp. 9-37; Tilden Press; 1981.

Energy efficiency and design deficiencies have helped to make air pollution in offices a bigger health problem than air pollution outdoors. Substances such as ammonia, asbestos, benzene, cadmium, carbon monoxide, ethanol, fiberglass, formaldehyde, methanol, nitropyrenes, ozone, PCBs, particulates, radon, tobacco smoke, toluene, trichlorethane, trichloroethylene, trinitrofluorenone and vinyl chloride are all present in the typical office environment and all are possibly hazardous. Some are potential or proven carcinogens, while a number, such as trichloroethylene, carbon monoxide and benzene have been implicated in central nervous system damage, dizziness, and other symptoms that could cause learning problems.

Mallov, Joseph S. (1976). MBK Neuropathy Among Spray Painters. Journal of the American Medical Assoc., Vol. 235, No. 14, pp. 1455-1457; April 5 1976.

Keywords: painting; occupational health and safety;

Mandell, Marshall; Waller Scanlon, Lynne (1979). Physical and Mental Allergies in Children. from Dr. Mandell's 5-Day Allergy Relief System, chapter 5, pp. 133-187; Thomas Y, Crowell Publishers; 1979.

Many types of poor behaviour in schools, from hyperactivity, irritability, violence, fatigue, restlessness, to poor academic performance, can be caused by food and chemical allergies. In many cases, the nervous system is totally incapable of functioning normally because it is under allergic distress. The child who reads well once in a while and poorly at other times; the child whose handwriting is poor one day and fine the next; the child who can sit still in the morning, but is impossible to control in the afternoon - some of these children may be demonstrating cerebral allergy. Many case studies are provided from the author's practice.

Marchant, R.,; Wnesley, B.; Frel, D.; Bartram, J.; Yoshida, K. (1985). A Community Indoor Air Pollution Program. Air Pollution Control Association, 1985.

The Saskatoon Community Health Unit Indoor Air Pollution Program is a collaboration of specialist community resources. Trained Public Health Inspectors field all requests for appropriate follow-up. Through the definition of the problem, preliminary measurements (humidity, temperature, formaldehyde, CO 2) and a short history, the appropriate specialist team members are then involved. A suggested referral by the family doctor to a specialist in environmental medicine provides a thorough health assessment. If a more detailed environmental study or a study to define the pollutant is required, an Industrial-Hygienist-Aerosol-Scientist will

do a 24-48 hour study of the problem under an individual contract. Ventilation Engineers from the National Research Council provide consultation on remedial environmental changes and pollution source identification. The team meets on a regular basis for in-service training and feedback and review of current issues.

Marchant, R.; Yoshida, K.; Figley, D.A. (1985). Mobile Home Residents' Exposure to a High Concentration of Formaldehyde — A Case History. Air Pollution Control Association, 1985.

A series of health complaints by an elderly couple soon after they occupied a new mobile home in suburban Saskatoon Canada prompted this investigation. Their symptoms included nausea, vomiting, dizziness, headaches, sleep disturbances, shortness of breath, burning eyes, running nose, and chronic fatigue. There was an initial indoor formaldehyde concentration of 0.7 ppm, far exceeding the recommended limit for residential buildings of 0.1 ppm. Testing revealed that the wall panelling (approx. 2-3 ppm) had a significantly higher emission rate than the cupboards (approx. 1 ppm) or subfloor (approx. 0.4 ppm). The occupants' medical history and physical examination showed only symptoms related to chronic ailments. Since occupying an ordinary house, their symptoms characteristic of formaldehyde have subsided.

Margulis, Stephen T. (1981). Building Accessibility in Relation to Door Hardware, Door Users and Door Use. Architectural and Transportation Barriers Compliance Board, 33 C St., SW Washington DC 20201; January 1981.

Keywords: architectural barriers; building accessibility; codes and standards; disability; doors; ergonomics; handicap;

Marha, Karel (1982). The State of Knowledge Concerning Radiations from Video Display Terminals. Canadian Centre for Occupational Health and Safety; 1982.

Keywords: video display terminals; occupational health and safety; offices;

Marha, Karel (1983). Low Frequency Emission from VDT's and Possible Adverse Biological Effects. Canadian Centre for Occupational Health and Safety; April 29 1983.

Keywords: video display terminals; occupational health and safety; offices;

Marha, Karel (1983). Very Low Frequency Fields Near VDT's and An Example of Their Removal. Canadian Centre for Occupational Health & Safety; September 1983.

Keywords: video display terminals; vlf fields; occupational health and safety; shielding;

Markham, John W.; Kirkbride, John; Pelmear, Peter L. (1986). Health Surveillance Data. Occupational Health in Ontario, Vol. 7, No. 4, pp 192 - 204; Fall, 1986; Ontario Ministry of Labour, Occupational Health and Safety Division, Toronto ON.

> An adequate health information system is an essential part of worker health surveillance. In Canada, as in most western industrialized countries, the necessary systems have not yet been developed. This paper enumerates the principles and factors that should be considered, as well as the benefits that may be derived from good information systems. The desirable types of information include worker identification, worker disease susceptibility, relevant clinical tests, biological monitoring, morbidity, mortality, specific hazards or exposures in the workplace, exposure measurements, occupation, population-at-risk records, and reproductive information. An extensive bibliography is included.

Marks, James G. (1981). Allergic Contact Dermatitis from Carbonless Copy Paper. Journal of the American Medical Assoc., Vol. 245, No. 22, pp. 2331-2332; June 12 1981.

> Allergic contact dermatitis to carbonless copy paper is documented. The offending agent proved to a coating on the paper - a colour-forming chemical composed of paratoluene sulfinate of Michler's hydrol (PTSMH). It apparently has a low sensitizing capacity.

Marks, James G., Jr.; Trautlein, Joseph J.; Zwillich, Clifford W.; Demers, Laurence M. (1984). Contact Urticaria and Airway Obstruction From Carbonless Copy Paper. Journal of the American Medical Association, pp. 1038-1040; August 1984.

> A 27-year-old woman experienced pruritus, eye and throat irritation, hoarseness, shortness of breath, and fatigue within half an hour of exposure to carbonless copy paper. On two separate occasions, she was purposely challenged in a controlled-blinded fashion with portions of the carbonless copy paper. This resulted on both occasions in contact urticaria of the hand that held the paper and changes in pulmonary function flow-volume loops characteristic of upper airway obstruction. It was concluded that the cutaneous and respiratory symptoms induced by the carbonless copy paper were probably related to prostaglandin release.

Matas, M; el-Guebaly, N; Harper, D.; Green, M.; Peterkin, A. (1986). Mental Illness and the Media: Part II. Content Analysis of Press Coverage of Mental Health Topics. Can. J. Psychiatry, Volume 31, June 1986; pp 431 - 433.

> The public image of psychiatry has been tarnished in recent years. In order to determine the extent to which press coverage has contributed to negative attitudes towards psychiatry, a content analysis was conducted of a random selection of newspaper articles which appeared over a twenty-

year period in two different newspapers. It was found that although there had been some minor changes over the years, such as more appropriate headlines and more direct quotes from psychiatric experts, on the whole, content and attitudes had changed very little. An accuracy check of media reporting of forensic cases over a 20-year period revealed that when reporters have access to written material, the accuracy levels are greatly improved.

Maulfair, Conrad G., Jr. (1987). Letter to Bruce M. Small & Associates Limited, re Study on Healthy Environments. unpublished.

The single most controllable ecological irritant is chemical. Although the immune system can tolerate and adapt to chemical exposures to a point, that point is often exceeded, and the immune system fails, resulting in symptoms and disease.

May, Charles D. (1976). Objective Clinical and Laboratory Studies of Immediate Hypersensitivity Reactions to Foods in Asthmatic Children. J. Allergy Clin. Immunol., Vol. 58, No. 4, pp. 500-515; October 1976.

Keywords: food hypersensitivity; asthma; children;

Mayhew, D.R.; Donelson, A.C.; Beirness, D.J.; Simpson, H.M. (1986). Youth, Alcohol and Relative Risk of Crash Involvement. Accid. Anal. & Prev., Vol. 18, No. 4, pp 273 - 287; 1986.

Deaths and injuries due to road-crash involvement are a major health and safety problem, especially among youth. Numerous factors can account for the overrepresentation of young drivers in road crashes and one of these — alcohol — has received renewed attention. This paper examines evidence pertaining to drinking and driving among youth to determine the extent to which alcohol has special significance for crashes involving young drivers. Findings show that frequent and heavy alcohol consumption among teenagers and young adults is not unusual, although they are less likely than older age groups to drive after drinking. Nonetheless, those young people who drive after drinking have a greater risk of crash involvement than older drinking drivers at all blood alcohol concentrations. Further investigation into the personal and social characteristics of young people who drive after drinking would provide a sounder empirical basis for policies and programmes to reduce crash involvement among youth.

McCauley, Gary (1987). Letter to Bruce M. Small and Associates Limited re Healthy Environments. unpublished; September, 1987.

Although surveys show Canadians place the issue of child health high on the national agenda, people at the Canadian Institute of Child Health often feel that children are Canada's forgotten people.

McCluskey-Fawcett, Kathleen A; Meck, Nancy; Harris, Marybeth (1986). Prevention During Prenatal and Infant Development: from Handbook of Prevention; Edelstein, Barry A. and Michelson, Larry, editors. Plenum Press, New York, 1986; pp. 43 - 73.

> Because of the great vulnerability of the embryo and fetus to environmental assault, the prenatal period is the most critical stage of human development. Many adverse outcomes during gestation can be prevented by good obstetrical management and maternal compliance. Prenatal examples discussed: in the area of maternal disease such as diabetes and sexually transmitted disease; in the area of maternal habits such as social, prescription and illicit drug use; and in the area of maternal characteristics such as age. Problems during the birth period discussed: analgesia and anesthesia, Casearean delivery, home delivery. Postnatal prevention issues discussed: Down's Syndrome, Spina Bifida.
>
> Improved prenatal care and expanding medical technology have permitted babies to be born and kept alive that would never have survived two decades ago. This achievement has not been matched in the area of decreasing morbidity, such that more infants may survive with severe handicaps than in previous years. In addition, actual practice of preventive services is not widespread and the whole issue of cost/benefit is not clearly resolved.

McDonald, J. Corbett (1984). Investigation of Employee Health Complaints at Les Terrasses de la Chaudiere: Final Report to TB/PSAC Steering Committee. Treasury Board of Canada, July 1984.

> Research is described into the extent and nature of Federal employee health complaints at a three-tower government office complex opened in 1977. The investigation had three components; a questionnaire survey of a random sample of employees, a telephone inquiry of a selected group of employees, and an environmental survey on selected floors and individual work locations. It was found that most of the employees had, since moving into the building, suffered from upper respiratory tract and eye irritation, together with a variety of other complaints — typically headache, drowsiness, exhaustion, sleeplessness and irritability — and sometimes skin dryness and irritation. People who work in cubicles tend to suffer more frequently than those in open areas or closed offices. The investigation failed to identify the cause. However, some floors and work location had less than optimal ventilation and control of temperature and humidity, partially due to the fact that the building was designed for predominantly open plan use and ventilated accordingly but was partitioned or divided into closed spaces which interferes with air movement.

McDowall, M.E. (1986). Mortality of Persons Resident in the Vicinity of Electricity Transmission Facilities. British Journal of Cancer, Volume 53, Number 2, 1986; pp. 271-279.

> The study examined whether the electricity transmission system presents a long term hazard to public health, by analyzing mortality data among nearly 8,000 persons who lived in the vicinity of transmission lines. Overall mortality was lower than expected and no evidence of major health hazards emerged. The study did not support previously reported associations of exposure to electro-magnetic fields with acute myeloid leukemia, other lympathic cancers, and suicide. The only statistically significant excess mortality was for lung cancer (in women, overall, and in persons living closest to the sub-stations); this result is difficult to interpret in the absence of smoking data, and is not supported by other evidence but does not appear to be due to the social class distribution of the study group. The idea that electromagnetic fields might act as weak cancer promoters, rather than initiators, is discussed.

McGee, Charles T. (1979). Health, Light, and the Electromagnetic Spectrum. How To Survive Modern Technology, chapter 5, pp. 108-116; Keats Publishing, Inc., 1979.

> Studies by researchers such as John Ott show that electromagnetic radiation can have negative effects on both plant life and people. Human muscle strength is weakened under exposure to light that lacks part of the natural spectrum. Classroom experiments indicate that student performance, behaviour and hyperactivity improve when regular fluorescent lights are replaced with full spectrum fluorescent lights. Microwaves & X rays have also been discovered to be health hazards.

McGrath, T.; Paolini, R.; Wright, G.R.; Kusiak, R. (1987). Smoking Survey of Ministry of Labour Employees. Occupational Health in Ontario, Vol. 8, No. 3, pp 102 - 111; Summer, 1987; Ontario Ministry of Labour, Occupational Health Branch, Toronto Canada.

> The results of a survey of Ministry of Labour employees' viewpoints on smoking within their workplace are presented. Employees were of the opinion that smoking should be restricted to designated areas that are ventilated so that exposure to secondhand smoke generated within Ministry premises does not occur.

McGregor, R.G.; Vasudev, P.; Letourneau, E.G.; McCullough, R.S.; Prantl, F.A.; Taniguchi, H. (1980). Background Concentrations of Radon and Radon Daughters in Canadian Homes. Health Physics, Vol. 39, pp. 285-289; August 1980; Pergamon Press Ltd.

> Keywords: radon; residential; Canadian homes; health effects;

McKillop Farlow, D'Arcy (1987). Achieving Health For All: The Epp Report. Healthsharing, pp 9 - 10; Summer, 1987.

> The Epp Report, Achieving Health For All, indicates some government movement to incorporate health promotion into overall health strategies and may provide a stepping stone to increasing budgets for health promotion activities. But it overemphasizes, according to this researcher, individual self-care without recognition of the polluted society within which we live. This emphasis may undercut the value of self-care models and deflect attention away from environment and socio-economic causes of ill health. It also pushes people to assume impossible levels of individual responsibility without recognizing that they have decreasing control over the environment in which they live.

McKnight, John L. (1986). Regenerating Community. From Consumer to Citizen: Building a Framework for Support; Chapter 2, pp 13 - 22; Canadian Mental Health Association; May, 1986.

> Community represents unique social tools that are unlike the social tool represented by a managed institution. For example, the structure of institutions is a design established to create control of people. On the other hand, the structure of associations is the result of people acting through consent. The roles of citizen and community are often traded in for the right to clienthood and consumer status. While we have reached the limits of institutional problem solving, we are only at the beginning of exploring the possibility of a new vision for community. This is a vision of regeneration, a vision of reassociating the exiled people who are the mentally disabled.

McLaughlin, Don E.; Kagen, Herbert P. (1974). The Effects of Sulfur Dioxide on Learning and Activity in the Rat: Psychology and Education Section. Proceedings of the West Virginia Academy of Science-CISTI, Vol. 45, No. 4 pp. 439-444; 1974.

> The investigation was an attempt to ascertain the behavioural effects of chronic exposure to sulfur dioxide, a major atmospheric pollutant. The behaviours of interest were learning in simple and complex learning tasks and activity. In addition, a progress record of each subject's weight was kept. The subjects consisted of forty-three male rats which were assigned to one of two control conditions or one of four experimental conditions. The results indicate that sulfur dioxide alone had no effect on performance. There was, however, a significant trials effect and the interaction between SO2 and the number of trials in the maze also proved to be significant. Activity was found to be increased as the SO2 concentrations increased. Finally, it was found that the rats living in the higher concentrations tended to be heavier than those in the lower concentrations.

McLeod, Linda (1987). Battered But Not Beaten: Preventing Wife Battering in Canada. Canadian Advisory Council on the Status of Women; June 1987.

> Almost 1 million Canadian women from all walks of life are physically, sexually and emotionally abused by their husbands, boyfriends, and former spouses. For these women, this means depression, isolation, physical injury, reduced life options, and sometimes death through homicide or suicide. For the children involved, it means terror, pain, behaviour problems during childhood, the likelihood that the cycle of violence will be repeated in their future families, and a higher risk of becoming violent outside the family. The typical battered woman is trapped in a cycle of poverty from which there has traditionally been little chance of escape. It is recommended that the government increase funding for shelters and staff trained to deal with the problem.

McVittie, Douglas J. (1986). The Control of Occupational Health Hazards in Construction. Occupational Health in Ontario, Vol. 7, No. 4, pp 205 - 212; Fall, 1986; Ontario Ministry of Labour, Occupational Health and Safety Division, Toronto ON.

> Construction workers may be exposed to a wide variety of toxic materials about which they know very little and over which they have little control. The traditional solutions in fixed industry, using substitution, ventilation, process modification and administrative controls, are inappropriate for construction sites, and control by procedure is more appropriate. The detailed and uniform specifications make it easy for regulatory agencies to assess compliance.

McWhinney, Ian R. (1987). Fine Words, But Will He Deliver?. CMAJ, Vol. 136, pp 473 - 474; March 1987.

> The "Achieving Health for All" report by Minister of National Health and Welfare Jake Epp is welcome but does not convey a sense of the massive changes that will have to occur. Regional and social class inequities, as well as health problems due to substance abuse, industrial hazards, environmental pollution, unemployment and social isolation, are challenges for public policy. Although they are very important for medicine and other health care professions, the record to date is not very good. "Health for All" is impossible because as our environment is constantly changing, so are the challenges to health.
>
> Government policies work against the policy in many ways. For instance, family medicine holds the most potential for health promotion, but there is little economic incentive for physicians to practise it. Most of the financial rewards go to those who have procedures to perform, either diagnostic or therapeutic. There is little incentive for a family physician to work with nurses in health promotion.

The belief that there is a technologic solution for every problem is not covered by the report. This is combined with the belief that if things go wrong somebody is to blame and must pay the price, the fragmentation of the profession, and the declining influence of the generalist in all fields of medicine. These are trends on which government can not be expected to have much influence.

Medical Services Division staff, Workers' Compensation Board (1984). Occupational Diseases. Workers' Compensation Board, Ontario, Canada; 1984.

This publication is designed as a reference to occupational hazards and diseases which are recognized and for which claims may be allowed under the terms of Ontario legislation. It includes a list by occupation of the hazards to which workers in a given trade may be exposed. In the past, many occupational diseases were named after the specific trades or occupations in which they were first observed. A few diseases still remain quite specific, but many hazards are now so widespread that they may be encountered in jobs in a wide variety of industries. Also listed are particular biological, chemical and physical hazards, their effects on the human body and the occupational or industry groups which may encounter these hazards. Cigarette smoking is discouraged in all occupations due to the possibility of ingestions of toxic substances through the act of smoking.

Meggs, W. (1987). Interview with Dr. William Meggs, Bethesda, MD. Personal communication, July 1987.

In this interview, Dr. Meggs commented that he regularly sees the health and injury consequences of the abuse of illicit drugs and alcohol, as well as the consequences of physical violence. He also cites the widespread use of cigarettes and caffeinated beverages such as coffee as dangerous to public health.

Melia, R.J.W.; Florey, C. du V.; Chinn, S.; Goldstein, B.D.; Brooks, A.G. F.; John, H.H.; Clark, John D.; Craighead, I.B.; Webster, X. (1980). The Relation Between Indoor Air Pollution from Nitrogen Dioxide and Respiratory Illness in Primary Schoolchildren: "Rabka Symposium". Bulletin Europeen de Physiopathologie Respiratoire; Vol. 16, No. 1, pp. 7-8; 1980.

In the UK an association between respiratory illness in primary schoolchildren and the use of gas for cooking has been found in two separate national samples. These findings appeared to be independent of interfering factors such as age, social class and smoking in the home. The association has been found in one large study in the USA, but not in three other studies in the same country. The authors suggest that nitrogen dioxide arising in the emissions of gas combustion might be the cause of the association.

Mendelsohn, Robert S. (1981). Male Practice: How Doctors Manipulate Women. Contemporary Books, Inc., Chicago IL; 1981.

> Chauvinistic male physicians subject their female patients to medical procedures that are degrading, unnecessary, and often dangerous. So thoroughly institutionalized is medicine's condescending attitude toward women that many doctors are unaware of their negative feelings toward female patients. Thus, they order lab tests and x-rays more indiscriminately for women than for men, over-prescribe for their female patients, treat childbirth almost as a disease, and intervene surgically when sometimes unnecessary, especially with hysterectomies and radical mastectomies.

Mes, Jos; Davies, David J.; Turton, Davida; Sun, Wing-Fung (1986). Levels and Trends of Chlorinated Hydrocarbon Contaminants in the Breast Milk of Canadian Women. Food Additives and Contaminants, Volume 3, Number 4, 1986; pp 313 - 322.

> A total of 210 breast milk samples from 5 different regions across Canada were analyzed for PCBs and other chlorinated hydrocarbons. There is an apparent increase in PCB residue levels since 1970, an increase should be viewed with caution and may be attributed to better sampling and analytical techniques. There was no evidence for the presence of hexachloro-1,3-butadiene, Mirex, octachlorostyrene, chlorinated naphthalenes, or tetrachlorobenzenes in breast milk, but there were residues of other compounds. Residue levels of breast milk in Canada were similar to those found in other industrial nations. Regional differences in residue levels appeared to be minimal.

Meyer, C. Beat; Hartley, Robert (1981). Inventory of Current Indoor Air Quality-Related Research. US Govt.; NTIS PB82-127952; April 1981.

> Keywords: pollution monitoring; public health; radon; nitrogen oxides; carbon monoxide; research inventory; formaldehyde; asbestos; particles; indoor air pollution;

Meyer, Beat (1983). Indoor Air Quality. Addison-Wesley Publishing Company, Inc.

> This author describes some of the factors that determine indoor air quality and reviews the status of knowledge in the field. He supplies a complete bibliography on indoor air quality problems and measurement techniques.

Miksch, R.R.; Hollowell, C.D.; Schmidt, H.E. (1982). Trace Organic Chemical Contaminants in Office Spaces: from Indoor Air Pollution; Spengler, John—editor. Environ. Int., Vol. 8, No. 1-6, pp. 129-137; 1982; Pergamon Press Ltd., Oxford, Toronto.

> Data is presented suggesting that workers in offices are exposed to a broad spectrum of solvent-related organic chemical contaminants present in very low concentrations relative to promulgated or recommended industrial hygiene exposure levels, but in high concentrations relative to outdoor air. With the aid of simple modeling, working hypotheses about various contaminant sources — new and aged building materials, wet-process photocopiers, tobacco smoke, and building maintenance products — are made with respect to the composition, amounts, and generation patterns of their emissions. The results show that effective control strategies can be implemented that do not compromise energy efficiency.

Millar, I.B.; Cooney, P.A. (1982). Urban Lead—A Study of Environmental Lead and its Significance to School Children in the Vicinity of a Major Trunk Road. Atmospheric Environment, Vol. 16, No. 3, pp. 615-620; Pergamon Press Ltd. 1982.

> Measurements of children's blood lead levels were ascertained in relation to lead in air and lead in dust attributed to an Inner London arterial highway carrying about 35,000 vehicles per day. The contribution of lead from deteriorating paintwork was also examined. The authors suggest that the findings indicate that lead from vehicles is not contributing measurably to the blood lead levels of children living or being educated in the area.

Millar, Wayne J.; Wigle, Donald T. (1986). Socioeconomic Disparities in Risk Factors for Cardiovascular Disease. Can Med Assoc Journal, Vol. 134, pp 127 - 132; January, 1986.

> Despite a general decline in mortality rates in recent decades, these rates are substantially higher among lower socioeconomic groups. To determine target groups for preventive health promotion programs, the prevalence of risk factors for cardiovascular disease by socioeconomic group in Canadian adults aged 20 to 69 years was examined through comparison of estimates from the 1978-79 Canada Health Survey, the 1981 Canada Fitness Survey and the labour force smoking surveys of 1975 and 1983. Level of education was used as a measure of socioeconomic status. The risk factors considered were cigarette smoking, obesity, elevated diastolic blood pressure, physical inactivity, excessive alcohol consumption, elevated serum cholesterol level, diabetes mellitus and the conjoint use of oral contraceptives and cigarettes. The prevalence of the risk factors tended to be higher among men and women with a low level of education. The results were consistent with those of recent Canadian studies showing that both men and women in lower socioeconomic groups are more likely to die from cardiovascular disease.

Miller, C. Arden; Coulter, Elizabeth J.; Schorr, Lisbeth B.; Fine, Amy; Adams-Taylor, Sharon (1985). The World Economic Crisis and the Children; United States Case Study: Special Report on the World Economic Crisis and Health. International Journal of Health Services, Volume 15, No. 1, pp 95 - 135; 1985.

> This is a review of the United States experience with issues of child health and services as they relate to changes in economic trends. No existing data systems are entirely adequate for reporting on the current health status of children. An important consideration for the monitoring of children's health is the status of subgroups such as those who are disadvantaged for reasons of poverty, discrimination, or geographic isolation. Ample evidence confirms that children living in poverty suffer adverse health consequences and the proportion of children living in poverty has increased steadily since 1975. When either local or widespread economic reversals are anticipated, health services and social supports for children need to be expanded rather than contracted.

Miller, Claudia S. (1979). Mass Psychogenic Illness or Chemically-Induced Hypersusceptibility?. U.S. Dept. of Health, Education, and Welfare, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health; 1979.

> There are literally millions of workers who are wondering why they never seem to feel good, why they are irritable when they get home, sleepy all day long, and exhausted when they get up in the morning. They are not hypochondriacs or hysterics. Most are simply susceptible to chemicals with which they are working, or to which they are exposed. It has been shown that so-called subjective symptoms of mass hysteria are identical in every respect to symptoms experienced by persons tested for susceptibility to various petrochemicals. It can be objectively demonstrated by testing affected individuals with suspected chemical incitants.

Miller, Joseph B. (1978). Hidden Food Ingredients, Chemical Food Additives and Incomplete Food Labels. Annals of Allergy, Vol. 41, No. 2, pp. 93-98; August 1978.

> Keywords: food additives; product labelling;

Miller, Suzanne M. (1980). Why Having Control Reduces Stress: If I Can Stop the Roller Coaster, I Don't Want to Get Off. Human Helplessness; Academic Press; Garber, J., Seligman, Martin E.P., editors; pp 71 - 95; 1980.

> Having control reduces the stress generated by an aversive event by providing individuals with an guaranteed upper limit or by enabling them to match their internal state with external events.

Moch-Sibony, A. (1981). The Effects of Prolonged Exposure to Noise on Certain Psycho Motor Intellectual and Personality Aspects of Children—Comparison Between A Soundproof and a Nonsoundproof School. Travail Humain, Vol. 44, No. 1, pp. 169-178; 1981.

> The effects were studied of prolonged exposition to noise on certain psychomotor, intellectual and personality aspects of children. The authors present the results obtained in a field study undertaken in a zone highly exposed to aviation noise. A comparison made between a sound-proofed and a non sound-proofed school brought out the following facts: the children did not express any feeling of disturbances as to the frequency of airplane passage; yet, after prolonged exposure to the auditory stimulus, perturbations of certain intellectual, psychomotor and personality aspects were observed. The authors estimate that the numerous airplane passages are at the origin of attentional troubles which would explain to a large extent the negative effects observed.

Mohr, Richard D. (1985). Invisible Minorities, Civil Rights, Democracy: Three Arguments for Gay Rights. The Philosophical Forum, Vol. XVII, No. 1, pp. 1-24; Fall 1985.

> The author puts forth an exacting which establishes that civil rights for lesbians and gay men as necessary preconditions for lesbians and gay men having equitable access to civic rights, i.e. the rights to the impartial administration of civil and criminal laws in defense of property and person. An invisible minority historically subjected to widespread social discrimination has reasonably guaranteed access to these rights only when the minority is guaranteed non-discrimination in employment, housing, and public services. He notes further that a society which forces minority views into invisibility, loses the ability to scrutinize and bring about repeal of undesirable legislation, thereby seriously curtailing the operation of those political processes ordinarily to be relied upon to protect minorities. The social prejudice against gays virtually eclipses their political rights, including freedom of speech, freedom of press, freedom of assembly, freedom to petition for the redress of grievances, and freedom to join with and be identified with other persons for common political goals. Virtually all the rights discusses involve public actions, which are impossible for a person who must remain invisible, hidden and secreted, in respect of his or her minority status, as a condition for maintaining his or her livelihood.

Molhave, L. (1979). Indoor Air Pollution Due to Building Materials: from Indoor Climate: Effects on Human Comfort, Performance, and Health in Residential, Commercial, and Light-industry Buildings; Fanger, P.O. and Valbjorn, O.—editors; pp. 89-110. Danish Building Research Institute, Copenhagen; 1979.

> Keywords: building materials; indoor air pollution; Danish research;

Molhave, Lars (1982). Indoor Air Pollution Due To Organic Gases and Vapours of Solvents in Building Materials: from Indoor Air Pollution; Spengler, John—editor; pp. 117-127. Environment International, vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

> The emission of organic gases and vapours of solvent type from 42 commonly used building materials was measured under standard conditions. An average of 22 compounds was found in the air around each building material, and the total concentration of gases and vapours was from 0.01 to 1410 mg/m 3. The risks of health effects due to the compounds identified were investigated, and criteria for future air quality standards were discussed. It is concluded that the possibility of negative health effects cannot be neglected, especially not for the more sensitive minority of the general population.

Molhave, Lars; Bach, Bodil; Pedersen, Ole F. (1986). Dose-Response Relation of Volatile Organic Compounds in the Sick Building Syndrome. Clinical Ecology, Volume IV, No. 2, Summer 1986.

> A survey of the literature indicates that houses with indoor climate problems have higher concentrations in the air of Volatile Organic Compounds (VOC) than houses without problems. In an attempt to establish a dose-response relationship, this study exposed a group of 62 human subjects in a double blind, controlled experiment to a mixture of 22 volatile organic compounds known to be indoor air pollutants. The subjects were all healthy and without diagnosed asthma, allergy or chronic bronchitis, but claimed to suffer from dry mucous membranes in eyes, nose or upper airways. A significant effect of exposure was found in relation to general air quality, odor, ability to concentrate and mucous membrane irritaion. Below 0.6 mg/m3 no irritation by VOC can be expected. Above 2 mg/m3 VOC are expected to cause irritation. Above 5 mg/m3 irritation and decreased mental performance may occur.

Monahan, John T.; Vaux, Alan (1983). Macroenvironment and Community Mental Health. Environmental Variables and the Prevention of Mental Illness, chapter 3, pp 27 - 41; Lexington Books; 1983.

> Aspects of the physical environment can create serious mental health problems. Those which have received the most research attention have been noise and density. In addition, economic status, unemployment, and economic change have been found to have an effect on community mental health variables. This research should lead community mental health professionals to pay greater attention to physical aspects of their own particular areas, including noise, crowding, architectural design, as well as community economy, particularly economic downturns, plant closings, and local unemployment rates. Such information should allow both the anticipation of service needs and the development of methods for preventing psychosocial problems and for enhancing human functioning.

Whenever environmental stressors may be prevented or diminished, mental health professionals should make every effort to do so. Participation in the environmental impact assessment process is one likely medium for such activity. When the macroenvironmental stressors are not preventable, the major role of the community mental health professional is to mitigate their effects through such techniques as anticipatory guidance and attribution therapy, carried out individually and through the media.

Moschandreas, D.J.; Rector, H.E. (1982). Indoor Radon Concentrations: from Indoor Air Pollution; Spengler, John—editor; pp. 77-82. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

The indoor air of 60 residences in and around a Maryland suburb of Washington DC was monitored in a pilot study to determine residential radon concentrations. In each residence, a radon grab sample was acquired in the living room, and if possible, in the basement. Over 60% of the residences sampled show air infiltration rates below 0.6 air changes per hour. Approximately 55% of all surveyed basements and 30% of all surveyed living areas displayed radon concentrations in excess of 4.0 nCi m -3. Assuming an equilibrium factor of 0.5, these radon levels may lead to working levels above the annual guidelines suggested by EPA for Florida homes built on land reclaimed from phosphate mining.

Moschandreas, D. (1986). Formaldehyde: Sources, Methods of Analysis, Exposure and Health Effects. Indoor Air, Vol. 6, 1986; Swedish Council for Building Research; Berglund, B.; Berglund, U.; Lindvall, T.; Sundell, J.; editors.

Elevated formaldehyde concentrations, higher than 100 ppb, are measured in many indoor environments. They relate positively with temperature and decrease with the age of the source. Urea formaldehyde bonded products can be improved to such a degree that indoor levels can be reduced to ambient levels if the materials are properly installed and used. Formaldehyde is not a potent carcinogen for humans. Pulmonary functions are similar in control and sample populations. Nasal and skin symptoms are higher in populations exposed to elevated formaldehyde concentrations.

Mueller Associates (1981). Wood Combustion: State-of-knowledge Survey of Environmental, Health, and Safety Aspects. US Govt.; NTIS DE83005070; October 1981.

Keywords: wood combustion; air pollution; sulfur dioxide; nitrogen oxides; hydrocarbons; carbon monoxide;

Muittari, Antero; Veneskoski, Tapani (1978). Natural and Synthetic Fibers as Causes of Asthma and Rhinitis: "a communication from Finland". Annals of Allergy, Vol. 41, pp. 48-50; July 1978.

Keywords: asthma; rhinitis; fibers; indoor air pollution;

Murray, T. Keith (1987). Diet and Health: The Canadian Experience. Am J Clin Nutr, No. 45; pp 1390 - 1393; 1987.

> The development of Canada's food selection guidelines is described and perceived errors in the process are noted. The guidelines were derived from the report of an expert committee, convened, not to develop guidelines, but to advise the government on the relationship between diet and cardiovascular disease and to identify the advice that should be given to the public. The request for such a study came from the margarine industry, which wanted to know what health claims could be made in advertisements. The committee contained no nutritionists nor educators. Dietary guidelines should be readily understandable by the public in order for them to be used fully, meaning that guidelines should be expressed in terms of food.

Mustard, Fraser J. (1987). Achieving Health for All: Implications for Canadian Health and Social Policies. MCAJ, Vol. 136; pp 471 - 473; March 1987.

> The broad philosophical concepts of health have swung in emphasis over the centuries between the important role of social and economic factors and individual choice in determining health status and the effectiveness of determining the cause of disease and developing specific therapeutic measures. Based on the government's policy of "Health for All", the individual choice concept (or the ecology of health) is again becoming paramount, with implications for the role of medicine in society and for groups of health care professionals. For example, achieving a solution to the first of the paper's health challenges, to reducing inequities in the health of low versus high income groups, is a formidable socioeconomic task which requires communication between those concerned with our health and social problems and those concerned with our economic future.
>
> Response to these challenges has to be met with limited resources; thus, there are implications for the level and distribution of funding among the different sectors responsible for health care. If too rapid, the changes necessitated by the emergence of the ecology of health as the dominant theory will be complex and at times will create conflict. One change already evident is that more and more physicians are being placed within managed health care services, with resultant impact on their professional freedom.

Nagda, Niren L.; Rector, Harry E. (1983). Guidelines for Monitoring Indoor Air Quality. US Govt.; NTIS PB83-264465; September 1983.

> This document provides guidelines for designing programs to measure indoor air quality. Brief summaries of past and current research and descriptions of indoor contaminants provide a background for developing the monitoring design. Factors that influence air quality are discussed with the aid of mass balance models. An extensive review of measurement systems, including a listing of numerous instruments with their performance specifications, is presented.

Nagira, T.; Hisashige, A.; Kume, Y.; Ueno, M.; Yamamoto, M.; Aoyama, H.; Kurumatani, N. (1981). Health Hazards Among Children in Air Polluted Districts, Report 2: Exposure to Automobile Exhaust and Prevalence of Subjective Symptoms Among School Children. Nippon Eiseigaku Zasshi, Vol. 36, No. 3, pp. 596-612; 1981.

> Recent rapid motorization in Japan has posed the serious problem of air pollution caused by automobile exhaust. Route 43 has the highest congestions of vehicular traffic in Japan and runs through densely residential areas. Children in schools located along this highway have been found to have increasing rates of respiratory disorders. NO2 concentrations near Route 43 have exceeded the short-term exposure limit (0.10-0.17 ppm) proposed as the guideline for the protection of public health by WHO Task Group, which also recommended that this limit be stricter for sensitive subjects such as children. In 1979, the authors polled children concerning respiratory, rhinopharyngeal and eye disorders in two elementary schools facing the highway and one school in a non-polluted area, using a self-administered questionnaire. Results were as follows: children attending the two polluted schools had higher rates of disorders relating to bronchial asthma, recurrent respiratory infection and allergies; a close relationship was found between the prevalence of such conditions and distance from the highway and this gradient corresponded to the level of nitrogen oxides; air conditioners furnished at schools appeared to have some remedying effect on these disorders; children who lived south of the highway had higher rates of disease due to higher concentration of exhaust carried at night by northerly winds.

Nathanson, Constance A. (1975). Illness and the Feminine Role; A Theoretical Review. Soc Sci Med, Vol 9, No 2; Pergamon Press; 1975.

> Women in the Western world live longer than men and have lower mortality rates for most causes of death. There is strong evidence that these differences are due to women's constitutionally greater resistance to infectious and degenerative disease. However, in sharp constrast to their favorable mortality, women report more physical and mental illness than men, and utilize health services at substantially higher rates. These latter differences are documented with health survey data from the United States and Great Britain. Three explanatory models to account for sex differences in illness experience are considered: 1) women report more illness than men because it is culturally more acceptable for them to be ill; 2) the sick role is more compatible with women's other role responsibilities; and 3) women have more illness than men because their assigned social roles are more stressful. Evaluation of these alternative models is based on a review of data from studies of variations in illness among women, and it is concluded that a model looking at illness behaviour as a function of the number and character of other role obligations offers the most promise for future research.

National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1977). Research Involving Children: Deliberations and Conclusions: Report and Recommendations. US Government, DHEW; 1977; pp 123 - 154.

The Commission identified three ethical principles that should underlie the conduct of biomedical and behavioral research involving human subjects: beneficence, respect for persons, and justice. In the case of research involving children, the challenge is to find a proper balance in applying these principles and to establish priorities among the principles when they appear to be in conflict. In order to promote the health of both children and adults, the participation of children in research is needed but those who conduct or sponsor such research must protect children from harm by limiting the risk to which they may be exposed as research subjects. Guidelines are given for research which presents more than minimal risk but no immediate prospect of direct benefit to the individual children involved. The threat of an epidemic that could be offset by developing a safe and effective vaccine might justify research involving risk greater than otherwise acceptable to establish safety, efficacy and dosage levels for children of different ages.

The incapacity of children to consent to involvement in research is one aspect of a more general condition of dependence on adults who are responsible for their care. There must, however, be respect for the child's developing autonomy. Any child capable of some degree of understanding (generally, a child of seven or older) should participate in research only if he or she assents. When parental permission cannot be relied upon as a protective mechanism, alternative mechanisms should be set in place to protect the health and welfare of the children.

National Program to Reduce Tobacco Use, Consultation, Planning and Implementation Committee (1987). Directional Paper of the National Program to Reduce Tobacco Use in Canada: Break Free. National Program to Reduce Tobacco Use; June 1987.

This directional paper outlines a national strategy aimed at achieving a generation of non-smokers in Canada by the year 2000. It was developed as a cooperative, collaborative effort of the federal, provincial, and territorial governments and national health organizations. Three goals are: 1) to protect the health and rights of non-smokers; 2) to help non-smokers to stay smoke-free; and 3) to encourage and help those who want to quit smoking to do so. For each goal, quantified short and long term objectives have been developed. These objectives ensure that both individual and environmental perspectives of the problem will be addressed. The following strategic directions have been identified: legislation; access to information; availability of services and programs; message promotion; support for citizen action; intersectoral policy coordination; and research and knowledge development.

Tobacco use represents the number one preventable health issue in Canada. More than 30,000 Canadians die each year from smoking-related illnesses. While overall tobacco use has declined in Canada, a number of disturbing trends persist: smoking onset among 12 to 14 year olds has remained high; the prevalence of smoking among young women (20 to 29) is increasing; and regional and socioeconomic differences in smoking rates continue to exist.

NcNall, Preston E. (1975). Practical Methods of Reducing Airborne Contaminants in Interior Spaces. Arch Environ Health, Vol. 30, pp. 552-556; Nov. 1975.

Keywords: indoor air pollution;

Needleman, Herbert L; Gunnoe, Charles; Leviton, Alan; Reed, Robert; Peresie, Henry; Maher, Cornelius; Barrett, Peter (1979). Deficits in Psychologic and Classroom Performance of Children With Elevated Dentine Lead Levels. The New England Journal of Medicine, Vol. 300, No. 13, pp. 689-695; Mass. Medical Society; March 29, 1979.

To measure the neuropsychologic effects of unidentified childhood exposure to lead, the performance of 58 children with high and 100 low dentine lead levels was compared. Children with high lead levels scored significantly less well on the Wechsler intelligence Scale for Children than those with low lead levels. This difference was also apparent on verbal subtests, on three other measures of auditory or speech processing and on a measure of attention. Analysis of variance showed that none of these differences could be explained by any of the 39 other variables studied. Also evaluated by a teachers' questionnaire was the classroom behavior of all 2146 children whose teeth were analyszed. The frequency of non-adaptive classroom behavior increased in a dose-related fashion to dentine lead level. Lead exposure, at doses below those producing symptoms severe enough to be diagnosed clinically, appears to be associated with neuropsychologic deficits that may interfere with classroom performance.

Needleman, Herbert L. (1983). Lead at Low Dose and the Behaviour of Children. NeuroToxicology, Vol. 4, No. 3, pp. 121-133; 1983.

Lead can be a useful paradigm with which to deepen our understanding of the health significance of hazardous substances in general, and to clarify the necessary steps and barriers to their removal from the human environment. Epidemiologic data demonstrate a clear effect of lead at low doses. When taken with animal studies which show disturbed learning at low dose in the rodent and non-human primate, altered development of synapses in the developing rodent brain and delayed appearance of brain cytochromes in the immature rodent, the case seems strong that lead at low doses is an important and widely distributed neurotoxin.

Nero, A.V. (1986). Radon in Dwellings; Exposure and Risk Analysis. Indoor Air, Vol. 6, 1986; Swedish Council for Building Research; Berglund, B.; Berglund, U.; Lindvall, T.; Sundell, J.; editors.

> A very broad range of concentrations of radon is observed inside buildings, particularly in homes, and even the average concentration has an estimated risk that is large by comparison with most environmental risks. There is estimated to be a chance of about one in a thousand for the average member of the population to contract lung cancer from indoor radon daughters. And significant numbers of people in many countries receive much higher exposures, corresponding to individual risks of lung cancer exceeding one percent. Control measures take the following pattern, at least in homes with high levels; source control has the greatest influence, ventilation has lesser influence, and air cleaning has questionable effect. Considerable progress is being made in developing strategies to locate and reduce excessive concentrations in existing residences and to prevent such levels in new buildings. These include guidelines for allocation of responsibility and for acceptability of indoor levels, as well as specification of means for identification and control of cases that may have concentrations.

Nethercott, James R. (1982). Health Effects of Formaldehyde. Corpus.

> This paper describes the health effects of formaldehyde. These include irritation to the skin, eye, lung and mucosal surfaces; sensitization; alteration in irritancy threshold; mutagenicity; carcinogenicity. Although some of these effects have not yet been proven in humans, the author feels that it is prudent to regard formaldehyde as a possible cause because of animal data. Detailed studies of persons who believe they are being intoxicated by low level formaldehyde exposure is necessary.

Neus, Hermann; Godderz, Werner; Otten, Heinz; Ruddel, Heinz; von Eiff, August-Wilhelm (1985). Family History of Hypertension and Cardiovascular Reactivity to Mental Stress — Effects of Stimulus Intensity and Environment. Journal of Hypertension, Vol. 3, No. 1, pp 31 - 37; Gower Medical Publishing Ltd.; 1985.

> This study examines the hypothesis that normotensives with hypertensive parents exhibit enhanced cardiovascular reactions to mental stress. Normally healthy male subjects were examined and, under laboratory conditions, administered an intensified standard stress test. Blood pressure, heart rate and stroke volume were measured. Subjects with at least one hypertensive parent exhibited enhanced responses of systolic and diastolic blood pressure and heart rate. The conclusion was made that cardiovascular hyper-reactivity in subjects with hypertensive parents is only apparent using sufficiently intense stimuli but there are familial trends in cardiovascular reactivity to mental stress.

New York Academy of Medicine (1981). Proceedings of the Symposium on Health Aspects of Indoor Air Pollution. Bulletin of the New York Academy of Medicine, Vol. 57, No. 10; December 1981.

Keywords: indoor air pollution; conference proceedings;

Newball, Harold H.; Brahim, Sami A. (1976). Respiratory Response to Domestic Fibrous Glass Exposure. Environmental Research, No. 12, pp. 201-207; 1976; Academic Press, Inc.

Keywords: fibrous glass exposure; respiratory response; health hazards;

Nieder, Joseph (1986). Evaluation and Treatment of Allergic Disorders in Children: A Psychiatric Perspective. Psychobiological Aspects of Allergic Disorders; chapter 10, pp 233 - 249; Praeger Publishers; 1986; Young, Stuart H., Rubin, James M., Daman, Harlan R., ed.

There is a complex interplay between asthmatic symptoms and emotional factors. Emotional factors can trigger or worsen asthma in a physiologically or biochemically predisposed individual. The disease process has a very definite emotional toll on the individual with asthma, as well as on other members of the family. The adaptation to illness, the alterations in lifestyle, and the family and personal interactions, all require complex psychological adaptations if one is to achieve the optimal degree of functioning with one's illness. Emotional factors and psychological problems which accompany or result from having asthma can be a major impediment to progress toward health.

Nietzel, Michael T.; Himelein, Melissa J. (1986). Prevention of Crime and Delinquency: from Handbook of Prevention; Edelstein, Barry A. and Michelson, Larry, editors. Plenum Press, New York, 1986; pp. 195 - 221.

Five areas are offered as crime-prevention basics. These are reduction of domestic violence; enhancement of various cognitive and behavioral competencies in children, adolescents and young adults; development of effective discipline techniques within families; promotion of safer environments and protected victims; and diversion of predelinquents and delinquents from formal contact with the criminal justice system. Citizens groups should be organized because fear of crime is greatest in communities that lack the power to regulate themselves or perceive that they lack such power.

Nitta, H.; Maeda, K. (1982). Personal Exposure Monitoring of Nitrogen Dioxide: from Indoor Air Pollution; Spengler, John—editor. Environ. Int., Vol. 8, No. 1/6, pp. 243-248; 1982; Pergamon Press, Oxford, Toronto.

Measurement of personal exposure to nitrogen dioxide for short and long term was made with a sensitive NO2 passive sampler to volunteer housewives and office workers in different seasons. These measurements were compared with the simultaneous measurement of outdoor and indoor concentration of the participants. A common result over all the measurements is the potential effect of using an unvented space heater to increase personal exposure. Mean personal exposure and indoor concentration are higher than outdoor levels elevated by the samples exposed to pollutant produced from the heater. A time-weighted indoor/outdoor activity model gives modestly improved estimates of personal exposure over those predicted from measured indoor concentrations alone.

Norris-Baker, Carolyn (1985). Perceived Importance of Community Settings in Daily Lives of Frail Elderly in Small Towns. Environmental Change/Social Change; EDRA 16; pp 216 - 222; Environmental Design Research Association; 1985.

A substantial number of older people living in rural areas experience the compound problems of aging and coping with physical disabilities, yet they continue to reside independently or with spouses in the community. For these frail individuals, the social and physical environment plays a vital role in maintaining the balance between their needs for autonomy and their needs for security. The present research explored the roles of attachment to and participation in small town settings by the frail elderly. Descriptions of settings that frail persons perceived as important in daily life, and their participation in settings in the community, were compared with the perceptions and participation of healthier, more active older persons. Findings indicate that the settings perceived as important in older peoples' lives varied widely and included many nonservice settings such as homes and social groups. The frail and active groups perceived similar numbers of settings as important, but the frail elderly were more limited in their use of those settings, particularly those that were more public and service-oriented. The frail elderly also identified a number of less accessible and less public settings which were important in their lives, but never frequented. When participation in community settings was examined within the context of personal characteristics such as age and health, findings suggested that the perceived importance of settings, and particularly their publicness, does play a modest role in community involvement. An extensive bibliography is included.

Novick, Marvyn (1986). Work and Well-Being: Social Choices for a Healthy Society: A New Work Agenda for Canada. Canadian Mental Health Association, Toronto Canada; 1986.

The employment crisis in the next decade threatens to undermine social and economic foundations of family life. A new work agenda is needed. The basic social choice facing Canadians is whether we re-affirm universal employment as essential to a healthy society, or withdraw into the view that maintenance income is a sufficient condition of basic well-being. The absence of good jobs for those in the 35 to 45 year old category will have a profound impact on personal health and the well-being of families. This will include vulnerabilities to illness and death from acute economic stress, particularly for men in their forties, as well as the re-emergence of child poverty. New approaches to full employment would rest on two key propositions: access to decent jobs remains a primary life aspiration for the vast majority of the adult population; and there are destructive rigidities in present distributions of work among Canadians which have severe health impacts on the unemployed, and are leading to growing stress for many. A new approach would include elements such as special tax rates to cushion annual job hour reductions, shelter policies to stabilize housing costs, national income credits for parents, universal leave programs, enriched pension entitlements, and tuition rebates and interest free loans for students of all ages.

Nussbaum, Karen (1981). Warning: Health Hazards for Office Workers. Working Women Education Fund, 1224 Huron Rd., Cleveland OH 44115; April 1981.

There are many hazards present in a modern office building. These include those resulting from improper ventilation and "tight building syndrome", hazardous office products such as liquid eraser products (which contain trichloroethylene and tetrachloroethylene, known carcinogens) and cleaning solvents (containing benzene, a carcinogen and toluene, a powerful narcotic), ozone from photocopiers, formaldehyde and passive cigarette smoke.

O'Banion, Dan R. (1981). An Ecological and Nutritional Approach to Behavioral Medicine. Charles C Thomas, Springfield IL; 1981.

This book presents a history and analysis of research and descriptive evidence indicating that food, chemical and inhalant substances play a major role in determining human health. The full range of psychological and physical health disorders, including learning disabilities and childhood hyperactivity are related to susceptibility and reactions to ecological and nutritional events. Extensive case reports are included.

O'Banion, Dan R. (1981). The Ecological and Nutritional Treatment of Health Disorders. Charles C Thomas, Springfield IL; 1981.

This book ties together the physiological and behavioral effects, both direct and indirect, of increased sensitivity to various ecological agents including common foods and chemicals used prevalently in our society. Individual susceptibility to specific food, chemical, and inhalant substances may contribute to a wide range of psychological and physical health problems, including learning disabilities. The effects of food and chemical sensitivities, stages of adaptation, levels of reaction, diagnosis and ecological treatment are all discussed.

O'Banion, Dan R. (1981). Skill Development and Maintenance. from The Ecological and Nutritional Treatment of Health Disorders, pp. 168-179; Charles C. Thomas, Springfield IL; 1981.

> Many people who are food and chemically sensitive have trouble developing and then maintaining appropriate social and academic skills. When a person is stressed physiologically, learning problems and skill deficits result and typically are treated solely from a psychological standpoint. Behaviors which are related to sensitivities and which affect learning are increased activation, an increased probability of frustration, decreased attention span, perceptual problems, and memory deficits. Most frequently chemically and food sensitive children experience problems in spelling, reading comprehension and auditory memory skills. Deficiencies in these areas may be indicative of malfunctioning neurological systems that predispose the individual to have difficulty learning certain types of tasks. Specific physiological systems may be malfunctioning, causing specific learning deficiencies. If an individual does have skill and learning deficiencies in specific areas due to an inability to attend to stimuli presented in a certain mode, special techniques and testing methods can be used. An improvement in the student's environment, removing the offending substances, will be the best long-term solution.

O'Banion, Dan R. (1981). The Chemical Problem: Chemical Contamination in the Work and School Environments. from An Ecological and Nutritional Approach to Behavioral Medicine, pp 69 -164; Charles C. Thomas, Springfield IL; 1981.

> One of the most important settings that influences a child's life is the school environment. This environment should be kept relatively uncontaminated especially for chemically sensitive children whose learning may be greatly affected by reactions to chemicals; however, even less chemically sensitive individuals who appear not to have any dramatic problem learning may be affected by such exposures. Slight fatigue, sleepiness, and uncooperativeness are often produced by chemical exposure and easily corrected by cleaning up the chemical environment in the school setting. Yet, the school environment is one of the most chemically contaminated environments in our society. A wide variety of indoor air pollutant sources in schools is described, including the use of pesticides, motor exhaust, chemicals in clothing, and lighting. How these affect learning and behavior in children is documented.

O'Banion, Dan R.; Peek, Leon A.; Butler, Joel R. (1981). Behaviors Characteristic of Learning Disabilities Related to Specific Foods in an Adolescent: Case Report 4. from An Ecological and Nutritional Approach to Behavioral Medicine, pp. 147-164; Charles C. Thomas Publisher, Springfield IL; 1981.

> A fifteen year old male adolescent with an extensive history of behavior and learning disorders had undergone traditional psychological, educational, and medical treatments to no avail. A food testing program in-

volving the ingestion of single foods of organic or less chemically contaminated sources was established to ascertain relationships between specific foods and the individual's physical, educational, and behavioral irregularities. It was found that extreme aggression and hyperactivity each occurred within minutes after the ingestion of a specific food. The food related to the hyperactive state was tested a second time under more closely observed conditions with a resulting decrease in performance on a symbol-digit coding task and the occurrence of a number reversal on one of the coding forms when the reaction was in progress.

O'Brien, L.M., Newman-Taylor, A.J.; Burge, P.S.; Harries, M.G.; Fawcett, L.W. and Pepys, J. (1979). Toluene Di-isocyanate-induced Asthma: II. Inhalation challenge tests and bronchial reactivity studies. Clinical Allergy, Vol. 9, pp. 7-15; 1979; Blackwell Scientific Publications.

Keywords: toluene diisocyanate; asthma; health hazards;

O'Hara, Bruce (1987). Work Well: A Guide to Creating Worktime Options Resource Centres. Canadian Mental Health Association.

Rather than having a scarcity of work, our society has a need to find ways to redistribute work to even out the extremes of the overworked and unemployed. This book is intended as a practical manual for promoting new work schedules. An excellent resource section is included, listing useful books, related reading, and contacts.

O'Quinn,Silas E.; Kennedy, C. Barrett (1965). Contact Dermatitis Due to Formaldehyde in Clothing Textiles. Journal of the American Medical Assoc., Vol. 194, No. 6; Nov. 8 1965.

Keywords: formaldehyde; clothing; contact dermatitis; health effects;

Olafsson, Olafur; Svensson, Per-Gunnar (1986). Unemployment-Related Lifestyle Changes and Health Disturbances in Adolescents and Children in the Western Countries. Soc. Sci. Med., Vol. 22, No. 11, pp 1105 - 1113; Pergamon Journals Ltd.; 1986.

According to official statistics, 11 million people under 25 in the 12 OECD member states are unemployed at any given time, a figure which in-depth studies show to be at least 40 to 50% higher. Unemployment hits mainly adolescents, school leavers, young unskilled adults, immigrants, and those who are in need of familial and social support such as the frail, sick, disabled children, and old people. Unemployment is endangering the socio-economic status of people, in spite of short-term unemployment benefits and is creating inequalities in health and serious social misfits.

The majority of young people do not learn to cope with unemployment. It fosters isolation, loss of self-esteem, frustration, and hopelessness. Unemployed school leavers are prone to a destructive life-style such as drug, tobacco and alcohol abuse and respond less to health promotion, family planning, hygienic and nutritional programmes. Children and family members of the unemployed suffer from various somatic and psychosomatic disorders. Loss of job or the mere prospect of becoming jobless have been found to cause elevated blood pressure and serum cholesterol, increased concentration of blood catecholamine and elimination of noradrenaline, an increase in the frequency of stress and psychosomatic diseases. After regaining employment, these values normalize. Umemployment is therefore considered as a real source of chronic stress which is considered to be a major contributor to cardiovascular diseases, ulcers, and asthma. The jobless exhibit a significantly higher prevalence of mental disorders, higher admission rates to mental hospitals, parasuicides and depression, and visits to doctors.

Olsen, Jorgen H.; Dossing, Martin (1982). Formaldehyde Induced Symptoms in Day Care Centers. Am. Ind. Hyg. Assoc. Journal, Vol. 23, pp. 366-370; May 1982.

A questionnaire study was performed among 70 employees at seven mobile day care centers where urea formaldehyde glued particle board has been used for indoor paneling and among 34 employees at three control institutions selected at random where no particle board has been used as building materials. Responses showed a significantly higher frequency of the following symptoms among the staff at the mobile institutions: mucous membrane irritation, headache, abnormal tiredness, menstrual irregularities and use of analgetics. The median concentration of formaldehyde in the mobile institutions was 0.43 mg/m 3 in contrast to a concentration in the control institutions of about 0.08 mg/m 3.

Ontario Federation of Labour (1982). Occupational Health and Safety: A Training Manual. Copp Clark Pitman, Toronto Canada; 1982.

This manual offers a comprehensive information base, enabling workers to understand their working environment. It covers a wide range of toxic substances and pollution sources, detailing how they affect health. Also covered are stress, material handling, making machinery and equipment safe, principles of ventilation, personal protective equipment and legislation in Ontario.

Ontario Mental Health Foundation (1987). The Ontario Mental Health Foundation Annual Report. The Ontario Mental Health Foundation; 1987.

The Foundation's major task is funding research investigations which have a bearing upon mental health and mental disorders. Some projects include testing ways of teaching social skills to mentally handicapped adults; examining the effects of social support and personality variables on maternal adaptation to the stress of a hearing impaired child; examining the effects of depression in a mother upon the children in a family.

Ontario Ministry of Energy (1987). Airing Out the Sick-Building Syndrome. Ministry of Energy, Municipal and Commercial Programs, Toronto Canada; 1987.

The sick-building syndrome is described with specific reference to Les Terrasses de la Chaudiere in Hull Quebec. General suggestions for improving indoor air quality and for follow-up help and information are included.

Ontario Ministry of Health (1987). Health Effects of Extremely Low Frequency Electromagnetic Fields: A Review of Clinical and Epidemiological Studies. Disease Control and Epidemiology Service, Public Health Branch, Ontario Ministry of Health; July, 1987.

This critical review of the literature was carried out to document the quality of scientific evidence regarding the possible public health risk of installation of extra high voltage line corridors. Literature on human health effects of exposure to extra low frequency fields which are created from many electrical sources, including transmission of electricity at high voltage, was examined. Adverse health effects studied in the reports examined include general health effects such as headaches and dizziness, adverse reproductive outcomes, and cancer. This literature fails to provide conclusive or convincing evidence that there is a significant public health risk associated with ELF fields. General agreement exists among scientific researchers that the ambiguities present in the current literature require clarification. A bibliography is included.

Orehek, J.; Massari, J.P.; Gayrard, P.; Grimaud, C.; Charpin, J. (1976). Effect of Short-Term, Low-Level Nitrogen Dioxide Exposure on Bronchial Sensitivity of Asthmatic Patients. Journal of Clinical Investigations, Vol. 57, February 1976, pp 301-307.

A study was undertaken to determine whether exposure to a realistic concentration of nitrogen dioxide could increase the bronchial sensitivity of asthmatic patients to bronchoconstrictor agents. Dose-response curves were established for changes in specific airway resistance in response to aerosolized carbachol in 20 asthmatics after each had spent 1 hour in an exposure chamber breathing both polluted and unpolluted air. Nitrogen dioxide induced a slight but significant increase in specific airway resistance and enhanced the bronchoconstrictor effect of carbachol in 13 subjects. Although the mechanisms underlying the nitrogen dioxide effect remain controversial, the present results demonstrate that very low levels of the substance can adversely affect some asthmatics.

Ostapovich, L.K. (1975). Conditions of Respiratory Route Exposure to Sulfur Dioxide and Formaldehyde and Subsequent Sensitization. Gigiena I Sanitariia, No. 2, pp. 9-13; 1975.

> The effects of concentration and conditions of exposure on the development of toxic and allergic reactions to sulfur dioxide and formaldehyde were investigated. It was concluded that sulfur dioxide has toxic effects which are manifested as an alteration in the chronaxy ratio of antagonistic muscles, as an increase in whole blood cholinesterase activity, and as changes in blood hemoglobin concentration and erythrocyte counts. Exposure to concentrations of formaldehyde in concentrations of 7 or 2 mg/m 3 leads to sensitization. The possibility of an early onset of allergy in response to low doses of the agents in question points to the need for conducting specific tests indicative of allergy—as highly sensitive indicators of adverse effects—in establishing hygienic norms for air pollution.

Ott, John (1973). Health And Light: The Effects of Natural and Artificial Light on Man and Other Living Things. Pocket Books/Simon & Schuster, 1973.

> In 1973 a study was conducted by the Environmental Health and Light Research Institute in Sarasota Florida, showing dramatic reactions in hyperactive children. In two first-grade classrooms, the standard cool white fluorescent tubes and fixtures with solid plastic diffusers remained unchanged. The plastic diffusers stopped the transmission of any trace of long-wavelength ultraviolet. In two other classrooms, the tubes were replaced with full-spectrum fluorescent tubes that more closely duplicated natural daylight. By means of hidden time-lapse cameras, student behaviour was observed and recorded. Under the standard cool white lighting, some children demonstrated nervous fatigue, irritability, lapses of attention, and hyperactive behaviour. Within a week of the new lights being installed, a marked improvement in their behaviour appeared and overall classroom performance improved. Experiments are also referred to in which the effect of light and darkness on the pineal gland has been studied, as well as studies concerning low-frequency non-ionizing radiation, hyperactivity and learning disabilities. A connection is also suggested between the hyperactive reaction to radiation from unshielded fluorescent tubes and the same symptoms triggered by artificial food flavours and colourings.

Ott, John; Mayron, Lewis W. (1976). Influence of Fluorescent Lights on Hyperactivity and Learning Disabilities. Journal of Learning Disabilities, Vol. 9, No. 7 (Aug/Sep 1976), pp. 417-422.

> This study describes in detail the study of the Environmental Health and Light Institute, in which four regular elementary windowless classrooms, two with standard type fluorescent cool-white tubes and two with full spectrum, radiation-shielded fluorescent fixtures,

were compared for their effects on hyperactive behaviour. Time-lapse photography was used to produce a permanent record of the children's actions. The study concluded that cool-white unshielded fluorescent lights could contribute to hyperactive behaviour.

Ott. W.; Flachsbart, P. (1982). Measurement of Carbon Monoxide Concentrations in Indoor and Outdoor Locations Using Personal Exposure Monitors: from Indoor Air Pollution; Spengler, John—editor. Environ. Int., Vol. 8, No. 1/6, pp. 295-304; 1982; Pergamon Press Ltd., Oxford, Toronto.

On 15 dates, 5000 measurements of carbon monoxide were made in downtown commercial settings in 4 California cities, using personal exposure monitoring (PEM) instruments. The data indicate that most commercial settings experience CO concentrations above zero indoors, because CO tends to seep into buildings from vehicular emissions outside. Levels in these locations usually are not above 5 ppm and seldom are higher than the U.S. health-related ambient air quality standards for CO. However, indoor garages and buildings with attached indoor parking areas are exceptions and can experience relatively high CO concentrations.

Ozkaynak, H.; Ryan, P.B.; Allen, G.A.; Turner, W.A. (1982). Indoor Air Quality Modeling; Compartmental Approach with Reactive Chemistry: from Indoor Air Pollution; Spengler, John—editor. Environ. Int., Vol. 8, No. 1-6, pp. 461-471; 1982; Pergamon Press, Oxford, Toronto.

Data on indoor/outdoor pollutant and tracer concentrations were collected during different periods in 1981 at a residence in Newton MA. Special studies within the kitchen were conducted to determine the vertical and horizontal variability of pollutant and tracer gas concentrations. A reactive chemistry model incorporating simplified NOx chemistry was developed to simulate pollutant concentrations indoors. Further monitoring and modeling studies to investigate the critical aspects of the short-term dynamics of the reactive pollutants inside homes with gas cooking stoves are recommended.

Ozkaynak, Haluk; Spengler, John D. (1985). Analysis of Health Effects Resulting from Population Exposures to Acid Precipitation Precursors. Environmental Health Perspectives; Vol. 63, pp. 45 - 55; 1985.

Types of available studies relevant to the quantification of air pollution health effects and their principal limitations are discussed. Assessments are provided based on review and re-analysis of previously reported data bases, synthesis of published findings, and original analysis of health data sets using new methods or recent size-specific particle mass measurements. Interim results from ongoing research activities on airborne particle health effects are presented. It is shown that preliminary results obtained from cross-sectional and time-series mortality studies appear to be consistent, indicating that particulate air pollution, even at current levels, could be of concern for public health. For future air pollution health effects studies, combinations of both improved exposure and health measures are needed. In particular, exposure and response data on acidic aerosols and oxidants involved in the formation of acid precipitation are vitally needed. Also needed are more prospective health studies to enable characterization of chronic and acute health effects. Also needed are better estimates of personal exposures to particles, acid aerosols, ozone, and nitrogen oxides, including information on indoor/outdoor particle exposures by source and chemical composition. Other research priorities are detailed.

Pape, Bonnie; Church, Kathryn (1987). Community Reinvestment: Balancing the Use of Resources to Support People With Mental Disabilities. Canadian Mental Health Association; June, 1987.

Our tendency to segregate mentally disabled persons into expensive formal health care and rehabilitation systems or discharge them with limited support into unprepared communities has created obvious problems for those who administer provincial mental health systems. It is the premise of this paper that in order to resolve this demand/supply dilemma, a strategy which emphasizes a reallocation of existing resources will have to employ community reinvestment as its guiding principle. The idea of community reinvestment promotes the belief that resources can be more effectively used from both an economic and quality of care point of view, by building the capacity of communities to assist mentally disabled persons to live with maximum reliance on the resources found or created within their natural environments, and with minimal dependence on formal service systems.

Paroski, Paul A. (1987). Health Care Delivery and the Concerns of Gay and Lesbian Adolescents. Journal of Adolescent Health Care, Vol. 8, pp. 188-192; 1987.

Homosexual adolescents in New York City were questioned concerning their perceived needs and health care requirements. Many had developed a stereotypic view of homosexuality and its associated lifestyle. The study revealed that a homosexual adolescent is often placed at a greater distance from his or her parents than his heterosexual counterpart. For those who reveal their sexual orientation, the family response is often not supportive. In the absence of a support group, the adolescent feels alone and isolated. Both male and females were concerned with receiving non-judgmental health care.

The authors conclude that the typical health care system does not meet the needs of such adolescents for support and guidance. The authors propose that health care providers need to be aware of the sense of isolation, the process of hiding one's homosexuality, and the conflicts that homosexual adolescents have regarding their lifestyle. They should be knowledgable about the specific and unique medical and biopsychosocial concerns of the homosexual adolescent. They stress that it is important not to make the assumption that all persons are heterosexual, thereby not allowing for the homosexual adolescent.

Pauls, Jake (1982). Stair Use and Design for Safety. unpublished; January 26 1982.

Keywords: falling accidents; stair safety; building design;

Paulson, George W. (1977). Environmental Effects on the Central Nervous System. Environmental Health Perspectives, Vol. 20, pp 75 - 96; 1977.

The central nervous system (CNS) is designed to respond to the environment and is peculiarly vulnerable to many of the influences found in the environment. Utilizing an anatomical classification, major toxins and stresses are reviewed with selections from recent references. Selective vulnerablity of certain areas to particular toxins is apparent at all levels of the CNS, although the amount of damage produced by an noxious agent depends on the age and genetic substrate of the subject. It is apparent that the effect of certain well known environmental toxins such as lead, mercury, etc., deserve continued surveillance. In addition, the overwhelming impact on the CNS of social damages such as trauma, alcohol, and tobacco cannot be ignored by environmentalists. The effect of the hospital and therapeutic environment has become apparent in view of increased awareness of iatrogenic disorders. The need for particular laboratory tests, for example examination of CSF and nerve conduction toxicity studies, is suggested. Epidemics such as recent solvent neuropathies suggest a need for continued animal studies that are chronic, as well as acute, evaluations when predicting the potential toxic effects of industrial compounds. An extensive bibliography is included.

Pearse, L.H.; Crocker, L.H. (1947). The Peckham Experiment: A Study in the Living Structure of Society. Yale University Press, New Haven, Connecticut USA, 1947.

This reference describes an extensive experiment in alternative lifestyles, conducted more than forty years ago. It yields insights as to the difficulties involved in setting up experimental situations for evaluating alternative social environments.

Pedersen, Niels Bang (1980). Occupational Hand Eczema From Formaldehyde in Price Labels. Contact Dermatitis, No. 6, pp. 57-58; 1980; Munksgaard Copenhagen.

Keywords: occupational health and safety; eczema; formaldehyde; health hazards;

Pengelly, L.D.; Goldsmith, C.H.; Kerigan, A.T.; Toplack, S.A.; Furlong, W.J. (1982). The Hamilton Study: Relationships Between Indoor and Outdoor Levels of Sulphur Dioxide, Nitrogen Dioxide and Particulates in Elementary Schools. Air Pollution Control Association, Pittsburgh PA; 1982.

> Some preliminary analyses of indoor and outdoor air pollution levels in 12 Hamilton, Ontario schools was carried out. Analysis of the results of SO2, NO2 and particulate measurement was carried out to determine the influence of school age and outdoor concentration on the measured indoor level. The design and construction of a building has an influence on the indodor level of NO2 over a range of outdoor NO2 levels. We can speculate that the principal factor which influences this relationship is the infiltration or ventilation rate. Newer schools tend to have positive ventilation systems which draw in "fresh air" from the outside; old schools did not have methods for providing for ventilation aside from opening windows.

Pengelly, L. David; Kerigan, Antony T.; Goldsmith, Charles H.; Inman, Elizabeth E. (1983). The Hamilton Study: Distribution of Factors Confounding the Relationship Between Air Quality and Respiratory Health. Air Pollution Control Association; June 1983.

> To clarify the role of ambient air qualilty among the many factors which contribute to chronic lung disease, the respiratory health of a cohort of elementary school children in Hamilton, Ontario was studied. A specific issue in this study was that of the distribution of the covariables of: tobacco smoking in the home, the use of gas for cooking, respiratory symptoms in other family members, respiratory disease in infancy, crowding in the home, income and social/occupational status as well as the distribution of air quality. The study found that the prevalence or magnitude of these covariables was not uniformly distributed among the diverse areas of the city studied, nor were the characteristics of air quality which were measured. In addition, the patterns of prevalence which were found among the areas tended to occur in the same direction, such that the effects of the covariables tended to reinforce each other. For instance, the children studied in the industrial core had the highest percentage of prevalence of all the covariables.

Pepelko, W.E.; Danner, R.M.; Clarke, N.A. (1980). Health Effects of Diesel Engine Emissions: Proceedings of an International Symposium, Volume 11. US Environmental Protection Agency, November 1980.

> The purpose of the symposium was to bring together scientists and engineers from the public and private sectors to discuss their research findings on the health effects of diesel engine emissions and to conclude with a discussion of health risk assessment of diesel exhaust. The Proceedings are organized into eight main sections corresponding to the format of the symposium and addressing physical and chemical character-

istics, in vitro carcinogenic and mutagenic effects, biochemical and metabolic effects, toxicological effects of inhaled emissions, mutagenic and carcinogenic potency of extracts of diesel and related environmental emissions, mutagenicity of inhaled diesel emissions, carcinogenic effects of exposure to diesel emissions, epidemiological studies, and lastly a panel discussion on health risk assessment of diesel emissions.

Pepys, J. (1982). Chemical Dusts, Vapours, and Fumes Causing Asthma: special issue of Environment International. Indoor Air Pollution; Environment International, Vol. 8, No. 1 - 6; pp 321 - 325; 1982.

Allergic respiratory disease due to common allergens of organic origin is well known. Less familiar, but of increasing importance, are chemicals of organic and inorganic nature, met as dusts, vapours, and fumes. Their relevance is shown in occupational respiratory allergic disorders. Confirmation is given by "real life", simulated, occupational-type provocation tests. Controlled exposure with minute amounts for brief periods, thus closely simulating allergic sensitivity, can precisely identify etiological causes in often complex exposures. The capacity of these widely different agents in different forms to elicit the different patterns of asthmatic reactions is a pointed example of their potential role, as well as the role of chemical agents in general. The introduction into indoor environments of such materials demands consideration of their possible allergenic effects and of the need to recognize the various forms of allergic respiratory reaction they may cause.

Petit, Ted L.; Alfano, Dennis P.; LeBoutillier, Janelle C. (1983). Early Lead Exposure and the Hippocampus: A Review and Recent Advances. NeuroToxicology, Vol.4, No. 1, pp. 79-94; 1983.

This report summarizes recent experiments conducted both in the authors' laboratory and in others' examining the effects of early lead exposure on the development of a specific portion of the human brain - the hippocampus, and behaviours characteristic of hippocampal dysfunction. Following postnatal lead exposure, marked reductions are seen in general hippocampal development. Observations support the suggesting that the hippocampus may play a critical role in mediating many of the behavioural changes observed following early lead exposure. However, as other brain areas are also clearly effected by lead, alternative explanations for these lead induced behavioural changes are also discussed.

Pfeifer, J.; Richter,J. ;Keveova, E.; Kral, V. (1983). Alterations of Selected Indicators of Local Immunity in Children Having Been Exposed to the Action of Formaldehyde of a Long Duration. Cs. Pediat., Vol. 38, No. 5, pp. 274-277; 1983.

A group of schoolchildren who had undergone long-term exposure to formaldehyde as well as an non-exposed control group were studied. This long-term study (3 years) looked at 159 children. Decreased values of salivary SIgA and of lysozym were repeatedly observed in exposed children and after elimination of the exposure, a prompt normalization of the findings was seen. A statistically significant higher occurrence of abnormal findings in the studied immunity indicators could also be demonstrated. On the basis of data, the authors consider buildings built of prefabricated woodchip board made with the use of a formaldehyde glue to be unfit for the long-term use of children.

Pfeiffer, Carl C. (1979). The Schizophrenias—At Least Three Types: Cerebral Allergy. from Mental and Elemental Nutrients, chapter 40, pp. 415-417; Keats Publishing; 1979.

Allergic children can have an allergy-tension-fatigue syndrome which results in disinterest in learning and thus decreases learning ability. Such symptoms as specific learning disabilities, perceptual-motor deficits, coordination deficits, hyperkinesis, emotional lability, short attention span, and abnormal electroencaphalograms have been cured or eased by diagnosis and the offending allergen being removed.

Phalen, Robert F.; Reischl, Peter; Faeder, Edward J.; Cavender, Finis L. (1981). Response of the Respiratory Tract to Inhaled Pollutants: from Aerosols, Airways & Asthma; Trautlein, Joseph J., MD—editor; pp. 125-139. ? ;1981.

Keywords: aerosols; inhaled pollutants; health effects; air pollution;

Philpott, William H.; Kalita, Dwight K. (1980). Human Ecology and Mental Health. from Brain Allergies: The Psycho-Nutrient Connection, chapter 3, pp 15- 27; Keats Publishing, Inc., 1980.

An individual's ability to handle toxins, pollens, foods and chemicals contracted from the environment differs considerably according to his or her unique chemical makeup. The more defective his or her ability, by inheritance, enzyme deficiency, malnutrition, harbored infection or otherwise, the more likely a person is to develop maladaptive symptoms on exposure to food and environmental contacts. A group of 250 emotionally disturbed patients developed major symptoms on exposure to their commonly consumed foods and frequently encountered chemicals. Symptoms included psychosis, schizophrenia, blurred vision, anxiety, dissociation, delusions, headaches, dizziness, inability to read or write, hyperactivity, and a whole range of gastro-intestinal problems.

Philpott, William H.; Philpott, Katherine; Khaleeluddin, Khaja (1981). The Roles of Bio-Ecologic Diagnosis and Treatment of Organic Factors in Mental Disorders. The Institute for Bio-Ecologic Medicine; January 1981.

Increasing pollution of the environment is beginning to be recognized as potential cause of nervous system reactions. Not only do we have these obvious pollutants to which people can react, but of even more basic importance is the observation that maladaptive central nervous system reactions can occur in susceptible people to otherwise nutritious food and/or chemicals.

Pim, Linda R. (1981). The Invisible Additives: Environmental Contaminants in Our Food. Doubleday Canada Limited, Toronto Canada; 1981.

Environmental additives are chemicals which inadvertently contaminate our food. Such substances as chlordane (a pesticide residue in milk), aflatoxin (a poisonous mould on peanuts) and sulfonamide (a drug residue in pork) contaminate the food supply and present health hazards.

Planek, Thomas W. (1982). Home Accidents: A Continuing Social Problem. Accid. Anal. & Prev., Vol. 14, No. 2, pp. 107-120; 1982.

Keywords: home accidents; residential safety;

Plumlee, Lawrence; Coerr, Stanton (1979). Panel Discussion: Role of High Risk Groups in the Derivation of Environmental Health Standards. Environmental Health Perspectives, Vol. 29, p. 155-159; 1979.

There are a variety of syndromes which lead to hypersusceptibility, including exposure to high levels of chemicals, nutritional deficiency, and genetic predisposal to environmental chemical sensitivities. In setting standards for environmental contaminants, there must be the awareness that high risk groups are not a small portion of the population, but include virtually everyone from time to time, due to differences in susceptibility for each pollutant, nutritional factors, etc.

Poole, Ron (1987). Environmental Health Alliance. unpublished.

An organization, The Environmental Health Alliance, has been set up among local health and environmental organizations. The first task is to address concerns to various levels of government regarding a proposed garbage incinerator in Detroit which will not be equipped with pollution reduction equipment. There is a concern that the toxic, carcinogenic fumes will pollute the air in Windsor.

Poyner, Barry (1980). Personal Factors in Domestic Accidents: Prevention Through Product and Environmental Design. British Dept. of Trade, Consumer Safety Unit, Millbank Tower, London SWIP 4QU England; April 1980.

Keywords: residential safety; accidents;

Pressman, Norman E.P. (1982). Priorities for Planning Livable Cities. Creating Livable Cities, pp 1 - 9; Pressman, Norman E.P. ed; 1982.

> The improvement of the urban environment is required to remove causes of danger; maximize opportunities for contact between individuals at block, neighbourhood and town levels, both among the residents themselves and with the various types of institutions; add economic value; and enhance the visual and aesthetic qualities of the urban environment as one means of promoting a favourable change in individual psychological behaviour.

Priesnitz, Wendy K. (1987). School Free. Village Books, Unionville ON; 1987.

> There is a growing community of families in Canada who chose to help their children learn without attendance at school. These deschoolers value autonomy as the full development of a child's capacity for independent reflection, judgement, decision-making, and action. If autonomy is seen as the link between intellect and responsible action, it cannot be fostered in an atmosphere of coercion. Compulsory attendance laws negate the right to self-reliance and autonomous action. Children suffer greatly from lack of respect and autonomy in schools. The conventional view of children in the educational system is that they are objects to be manipulated. This is apparent in the use of behavioural psychology to create classroom behaviour acceptable to the teacher as well as in the top-down style of curriculum design which views children as empty vessels into which knowledge is poured by the teacher. A non-compulsory, more broadly-based system of community education is proposed in which people of all ages would participate in an on-going, self-generated process.

Priesnitz, Wendy (1987). Moving Away From Assembly-Line Education. Toronto Star, September, 1987.

> A severe isolation from real-life experiences in the education system has led to a separation from the fact that learning is an activity which is natural to human beings. Children have ceased to be authentic participants in the life of society and would learn better in an environment free from compulsory schooling and rigid age segregation.

Proctor, N.H.; Hughes, J.P. (1978). Chemical Hazards in the Workplace: The Chemical Hazards: Portland Cement; Propane; Ozone; Formaldehyde; Formic Acid; Arsenic; Ammonia; Carbon Dioxide. J.B. Lippincott Co., Philadelphia PA; 1978.

> Keywords: chemical hazards; workplace; portland cement; propane; ozone; formaldehyde; formic acid; arsenic; ammonia; carbon dioxide;

Proshansky, Harold M. (1975). The Environmental Crisis In Dignity. Journal of Social Issues, Vol. 29, No. 4; pp 1 - 19; 1975.

> The environmental crisis in human dignity lies not just in overuse, the misuse, and the decay of physical settings, but far more significantly in how we conceive of the individual in relation to any such setting. In the design and organization of physical settings, the human properties of the individual are ignored, oversimplified, or implicitly assumed. Spaces and places are improperly designed not only in physical terms; designs overlook human needs for privacy, territoriality and freedom of choice, and the conceiving of the individual as a simple "machine man". Unintended consequences are often ignored and no attempt is made to evaluate just how well the setting actually works. The danger is that the person will adjust and at the price of a continuing erosion of the properties that make him distinctively human. It is imperative that as behavioral scientists turn to the systematic study of man/environment problems they recognize the need to maintain the contextual reality and integrity of any such problem as it evolves, develops, and becomes modified in the time framework of a complex society.

Proshansky, Harold M. (1985). Preface — Environmental Change/Social Change. Environmental Change/Social Change, pp iii - iv; Klein, S., Wener, R., Lehman, S, editors; Environmental Design Research Association; June 1985.

> Environmental settings and social settings are each expressions of the nature and meaning of the other. Attempts at environmental change to affect social change must begin with understanding: knowing fully the nature, meaning, and functions of the environmental setting we are seeking to change. A planned and rationally determined change in physical setting carries with it unintended as well as intended consequences. Seeking and achieving scientific understanding of a human problem is one thing; applying that understanding and resolving that problem is another. In a democratic society only those who populate the society can make those solutions realities.

Proshansky, Harold M. (1986). Psychological Aspects of the Quality of Urban Life. The Quality of Urban Life; Chapter 2, pp 19 - 29; Walter de Gruyter & Co.; Berlin, New York; 1986.

> There are many definitions and meanings to the term "quality of urban life". The concept of quality is multidimensional one, so the author suggests a more answerable question: What kinds of quality, for what kinds of people, in what kinds of places? Urban life is more than the organization and integration of a variety of physical settings. It not only consists of people who engage in a wide range of activities in these various physical contexts, but those individuals and activities are in turn organized and defined by larger social structures such as relationships between individuals, groups, and social institutions.

There must be a match or coherence between the person and his/her physical setting which must be examined over the life cycle of both. The quality of urban physical environments is, in the end, also rooted in many types of environmental factors such as freedom from intergroup conflicts, full employment, maintaining democratic freedoms, integrity in public life, etc.

Prudham, D.; Evans, J. Grimley (1981). Factors Associated with Falls in the Elderly: A Community Study. Age and Ageing, Vol. 10, No. 3, pp 141-146; August 1981.

Keywords: accidents; age factors; aged cerebrovascular disorders; female; wound and injuries; etiology;

Pryor, Gordon T.; Uyeno, Edward T.;Tilson, Hugh A.; Mitchell, Clifford L. (1983). Assessment of Chemicals Using a Battery of Neurobehavioral Tests: A Comparative Study. Neurobehavioral Toxicology and Teratology, Vol. 5, pp. 91-117; 1983.

Eight chemicals (acrylamide, methyl mercury, chlordecone, tetraethyl tin, triethyl lead, lead acetate, arsenic, monosodium salicylate) were compared with reference to their toxic effect on the central nervous system. The battery of tests used may have utility in the assessment of the potential neurobehavioral toxicity of various chemicals because the results compared favourably with what is known about the chemicals from other experiments with animals and from human experience.

Pryor, Paul; Reno, Stanley J. (1981). Health Hazard Evaluation Report, HETA 81-305-961, Aurora Schools. National Institute for Occupational Safety & Health, Hazard Evaluation and Technical Assistance Branch, Division of Surveillance, Hazard Evaluations, and Field Studies, Cincinnati OH.

At the request of the Aurora Schools, Aurora Colorado, an environmental evaluation was conducted at the East Middle School by NIOSH on June 19, 1981. The request concerned the potential exposure to teacher aides from methyl alcohol during the use of spirit duplicators. All of the teacher aides experienced some adverse health effects, e.g. blurred vision, headaches, burning of the nose, sluggishness, dizziness, sore throat, dermatitis, chest tightness, and depression—symptoms characteristic of toxic exposure to methyl alcohol. On the basis of the environmental and medical data, NIOSH determined that a health hazard from excessive methyl alcohol existed to the teacher aides. This exposure exists to those operating the duplicator, as well as those persons present in the room while this process is in operation. Recommendations on elimination or controlling the health hazard are included.

Raab, Karl H. (1985). Appropriate Technology for Residential Air Quality. Air Pollution Control Association, 1985.

> In the absence of meaningful monitoring of residences, modest control approaches are appropriate. A general strategy should deal with particulate matter reduction because ample evidence indicates that particulate matter causes the major health risks in residential air. Some common household technologies can be easily modified to moderate their effect on indoor air.
>
> A properly designed forced air heating system can produce better air quality than a hot water system if a medium efficiency extended surface fabric filter is used. If continuous low-speed fan operation is added, the system achieves temperature equalization, humidity distribution, and local odour dispersal as well. Vacuum cleaner studies indicate resuspension of precipitated particles and up to tenfold increases in suspended microbiological material. For bare floors, a manual carpet sweeper and damp mop are more appropriate. The high moisture generation from showering can be substantially reduced with a European-style hand-held hose unit. Bathroom ventilation technology has evolved to oversized, noisy exhaust fans which are infrequently used. Kitchen exhaust fans attached to an unvented hood introduces an increased health risk, possibly as a result of the recycled air stream being directed toward the user.

Raloff, J. (1987). Kids Leukemia From Parents' Exposures?. Science News, Vol. 132, pp 38 - 39; July 18, 1987.

> A new study, first reported in the July issue of Journal of the National Cancer Institute, by Peters, John M. et al, says that a parent's workplace exposure to any of several classes of chemicals — particularly chlorinated solvents — or use of incense or pesticides around the home may increase children's risk of developing leukemia. The study surveyed 123 pairs of Los Angeles County families. Each pair contained one family with a leukemic child under age 10 and one family with a healthy child. A father's workplace exposure to chlorinated solvents increased his child's risk of developing leukemia, and the risk increased with frequency of exposure — to 8 times the expected rate when fathers encountered the solvents at least weekly. The authors surmise that fathers may have brought home traces of the chemical on their clothes or breath. Similar exposures to spray paint, cutting oil, methyl ethyl ketone, and dyes or pigments also showed signs of increasing a child's risk of developing leukemia. There were also notably increased risks, during nursing and pregnancy, associated with a parent's use of either incense or household and garden pesticides. A follow-up survey is being conducted.

Rand, George (1979). Caution: The Office Environment May be Hazardous to Your Health: The Need for an Ecological Approach to its Design. AIA Journal, pp. 38-41, 78; October 1979.

> Keywords: occupational health and safety; indoor air pollution; offices; health hazards;

Rand, George (1985). Examining 'Sick' Buildings. Architecture, January 1985, pp. 80-83.

The author summarizes the results of a November 1984 seminar on indoor air quality sponsored by the American Institute of Architects and the California Council/AIA in response to growing concern over the "sick building syndrome". He quotes Harry Jacobs, president of the California Council: "So many different types of people use our buildings, from infants to the frail elderly in nursing homes, as well as the hardy people in between who may not be at all sensitive to polluted air. Research on health needs to be taken as seriously as the structural integrity of buildings, and it may mean adding a new type of consultant to the already long list of specialists needed to design a complex building. The architect may now have to master the languages of chemistry, biology, and medicine in order to competently orchestrate the health aspects of buildings."

Randolph, Theron G. (1976). Air Pollution. from Human Ecology and Susceptibility to the Chemical Environment, fifth printing; part 111, pp 35-62; Charles C. Thomas; 1976.

Environmental pollutants, both indoor and outdoor, can have debilitating mental and physical effects, especially on highly susceptible persons. The major sources of air pollution in homes and public places, such as schools, are: fuels, solvents and their combustion products; refrigerants and spray containers; insecticides; sponge rubber; plastics; mechanical devices; automobiles; amd scented cleaning products. Indoor chemical air pollution of schools as a contributing cause of poor scholastic performance of susceptible children and the dopiness and confusion of susceptible teachers is rarely diagnosed correctly. The problem presented by indoor air pollution is sufficiently acute to warrant the transfer of certain highly susceptible students and teachers to more satisfactorily located, constructed, equipped, heated and ventilated classrooms or schools.

Randolph, Theron G. (1976). Human Ecology and Susceptibility to the Chemical Environment. Charles C. Thomas; 1976.

The author describes a wide range of clinical manifestations of maladaptation to the chemical environment—physical and mental, chronic and acute. The major chemical incitants are described and the tendency for susceptibility to spread to related materials to which cumulative exposures exist is emphasized. The diagnostic routine of comprehensive environmental control is explained. The author shows how finding and avoiding the inciting causes of illness are superior to treating the effects of illnesses.

Randolph, Theron G.; Moss, Ralph W. (1980). An Alternative Approach to Allergies: The New Field of Clinical Ecology Unravels the Environmental Causes of Mental and Physical Ills. Fitzhenry & Whiteside Limited, Toronto Canada; 1980.

> Many physical and mental illnesses are caused by our increasingly contaminated environment. For those who are susceptible, everyday chemicals (gas from the kitchen range, supermarket food additives, cleaning compounds, automobile exhaust, etc.) can be a cause of mental and physical disease. Use of chemicals in schools can contribute to the overall chemical and food problem to cause poor performance by both children and teachers. Poorly designed heating and cooking systems are a major source of trouble, as are janitorial chemicals, office and art supplies. Studies of indoor air pollution in schools have been conducted with resulting anecdotal proof of cause and remedy.

Rapoport, Amos (1985). Thinking About Home Environments: A Conceptual Framework. Home Environments, Human Behavior and Environment; Vol. 8; pp. 255 - 286; Plenum Press; New York; 1985; Altman, Irwin and Werner, Carol M., editors.

> Choice (preference) is important in people's interaction with all environments and is central regarding home environments; an imposed setting is unlikely to be a home environment. Constraints limiting and distorting choice may be: lack of resources and market choice; inability to cope or plan; degree of willingess and ability to move; knowledge of alternatives; external constraints like prejudice, discrimination.

Rapp, Doris (1979). Allergies and the Hyperactive Child. Sovereign Books, Simon & Schuster; 1979.

> Medical reports from 1908 to the present indicate that a relationship between allergy and hyperactivity might exist. Anecdotal examples of the author's patients whose hyperactivity and learning difficulties were helped by diet modification are presented. Such things as easy distractibility, impulsiveness, emotional problems, poor coordination; perception problems, learning problems related to reading and spelling and short attention span are included under the category Minimal Brain Dysfunction. Hyperactivity, fatigue and behaviour and learning problems are often caused by medical problems such as allergies, anemia, hypoglycemia and lead poisoning.

Rapp, Doris J.; Bamberg, Dorothy (1986). The Impossible Child: A Guide for Caring Teachers and Parents. Practical Allergy Research Foundation, Buffalo NY; 1986.

> Children who exhibit learning or behaviour problems may have an unsuspected or unrecognized allergy. This book is designed to help

educators and parents recognize which children have allergies, or food or chemical sensitivities interfering with their ability to learn and behave normally, and provides suggestions for helping these children. Graphic examples are presented which illustrate health and cognitive reactions by children to chemicals in the environment.

Ray, Sammy M.; Trieff, Norman M. (1980). Bioaccumulation of Anthropogenic Toxins in the Ecosystem. from Environment & Health, pp. 93-120; Norman M. Trieff, editor; Ann Arbor Science Publishers, Inc.

Many natural and synthetic compounds have entered the ecosystem in the past 40 years. The adverse effects of many of these were unanticipated, in that these compounds are highly resistant to degradation by natural processes and there is often a pervasive buildup on a worldwide basis. There are two types of biological endpoints in the development of water quality criteria: nonthreshold and threshold effects. In the case of carcinogens, mutagens and teratogens, thresholds cannot be established because even extremely small doses must be assumed to result in a finite increase in the incidence of response. Thus, safe levels cannot be established.

Raymer, Warren J. (1986). FDA Issues Sulfite Ban. American Academy of Environmental Medicine Newsletter, Vol. 21, No. 3, p 5; Winter, 1986.

The American Food and Drug Administration has banned the use of sulfites as preservatives in fresh fruits and vegetables. The agency cites a growing number of adverse reactions to the compounds, including at least 13 deaths. The ban applies to retail sales of fresh produce by food stores and restaurants. In addition, within six months, the FDA will require new labeling of processed foods that contain detectable levels of the compounds.

Rea, William J.; Bell, Iris R.; Suits, Charles W.; Smiley, Ralph E. (1978). Food and Chemical Susceptibility after Environmental Chemical Overexposure: Case Histories: Case Report. Annals of Allergy, Vol. 41, No. 2, pp. 101-110; August 1978.

Twelve patients with overexposure to commonly used environmental chemicals were studied. After the overexposure all developed recurrent signs and symptoms of inflammatory type dieseases that were the result of ambient chemical fumes in the air and home environments. A period of time in a relatively fume-free and particle-free environment cleared the majority of symptoms and signs without the use of medication. Double-blind rechallenge with ambient dose levels of synthetic chemicals reproduced most of the symptomatology. Laboratory findings included abnormalities in complement, T-lymphocytes, eosinophils and IgG. The data suggest that some chemicals can trigger and propagate certain non-malignant inflammatory diseases, and re-emphasize the seriousness of exposures to levels of some chemicals in our environment which were previously considered safe.

Once an individual is sensitized to a solitary chemical it is apparent that continued exposures result in a spreading phenomenon. Once this spreading occurs, reactions then proceed upon minute exposures. Spreading was demonstrated clearly in the patients in this series. After a massive exposure to one type of chemical the individual then became intolerant to ambient concentrations of many others. The mechanism of this spreading phenomenon is unclear at the present time.

Rea, William J. (1978). Environmentally Triggered Cardiac Disease. Annals of Allergy, Vol. 40, No. 4, pp. 243-251; April 1978.

Twelve consecutive, highly selected patients with non-arteriosclerotic cardiac arrhythmias and/or chest pain refractory to medication, having various associated symptoms relating to smooth muscle sensitization, were studied in a rigidly controlled, relatively fume- and particle-free environment. The majority of signs and symptoms were cleared in 10 patients without medication while under environmental control and all arrhythmias were reproduced with controlled, repeated, individual blind and double-blind, incitant challenges in 10 out of 12 patients. The incitants were common foods and chemicals to which the individual has been exposed frequently. Double-blind challenges with ambient doses of inhaled chemicals also reproduced the spectrum of arrhythmias (natural gas, odour of cigarette smoke, chlorine, perfume, pine-scented floor wash, ethyl alcohol, formaldehyde, phenol and pesticides). This myocardial involvement appeared to be part of a more generalized sensitization of smooth muscle. The distorted homeostatic mechanism included abnormal positive C-reactive protein, serum complements and T-B cell interactions in individual patients.

Rea, William J. (1979). The Environmental Aspects of Ear, Nose and Throat Disease: Part 1. J.C.E.O.R.L. & Allergy, Vol. 41, No. 7, pp. 41-56; July 1979; Medical Digest.

Ear, nose and throat involvement with environmental triggering factors appears to be the main early warning sign of environmentally triggered disease, according to this author. Sensitivity to odours seems to be the most common, many persons being intolerant of the odours of such substances as car exhaust, perfume, cigarette smoke, aerosol sprays, formaldehyde, alcohol, phenol, food, mould and dusts. Often rhinitis occurs. Recurrent sinusitis as well as severe otitis, various forms of vertigo (including Meniere's disease), and laryngeal edema are frequent presentations of the problem. Any portion of the respiratory system can be involved, resulting in such inflammatory diseases as recurrent bronchitis, bronchiectasis, and asthma. A masking phenomenon is also described which initially hides an adverse reaction.

Rea, William J. (1979). The Environmental Aspects of Ear, Nose and Throat Disease: Part II. J.C.E.O.R.L. & Allergy Digest, Vol. 41, No. 8/9, pp. 41-54; August/September 1979.

> This article reviews many immune parameters that can be measured to help the clinician define changes in the body homeostatic mechanisms that occur on exposure to offending environmental agents. The researcher suggests that allergic diseases can be prevented from developing into measurable end-stage inflammatory disease, if treated early. It is being shown that patients may do well for a few months to several years with injection therapy for pollen, dust, mould, and food sensitivities, and then suddenly start deteriorating. They may lose their food sensitivity but develop a chemical sensitivity problem. It is not certain why this spreading phenomenon occurs, but it appears to be due to an overload of synthetic chemicals. Treatment of chemical sensitivity is complex, because most treatment consists of avoidance.

Rea, William J. (1979). Diagnosing Food and Chemical Susceptibility. Continuing Education, pp. 47-48, 52-53, 57-59; September 1979.

> The author describes clinical experience in which a spectrum of disorders affecting smooth muscles, mucous membranes, and collagen in the respiratory, gastrointestinal, genitourinary, and vascular systems are manifested. The variety of symptoms presented are often mistaken for hypochondriasis, but actually are due to reactions to foods and chemicals found in the patient's home and work environments. Careful clinical histories should alert the physician, who can confirm suspicions by eliminating the potentially offending agents, and challenging the patient with them under controlled circumstances.

Rea, William J.; Butler, Joel R.; Laseter, John L.; DeLeon, Ildefonso R. (1984). Pesticides & Brain-function Changes in a Controlled Environment. Clinical Ecology, Vol. 11, No. 3, pp. 145-150; Summer 1984.

> The purpose of the present study was to determine: the extent to which chlorinated hydrocarbon pesticides in environmentally sensitive patients would be reduced by Environmental Control Unit (ECU) treatment programs; and the correlation of brain-function/psychological test results with treatment effect. Before and after therapy studies were performed on 40 ECU patients with proven levels of blood pesticides. There was a significant decrease in magnitude of blood pesticides and a significant increase in performance on brain-function/psychological tests after ECU treatment. There was also a corresponding decrease in symptoms overall. It was concluded that rigid environmental controls in treatment strongly contributed to the decrease in blood pesticide levels. Further, a more serious psychological profile was associated with these patients who showed improvement consistent with treatment.

Rea, William J.; Johnson, Alfred R.; Youdim, Said; Fenyves, Ervin J.; Samadi, N. (1986). T & B Lymphocyte Parameters Measured in Chemically Sensitive Patients and Controls. Clinical Ecology, Volume IV, No. 1, pp 11 - 14; 1986.

> The T & B lymphocytes and T subsets of 70 proven chemically sensitive patients (symptoms including vascular dysfunction) with immune abnormalities were measured and suppression of the T8 suppressor cells was observed to the p = .0001 significance level versus the control subjects. The 27 asthmatics had no significant change over the controls.

Rea, William J. (1987). Environmental Electromagnetic Assessment Under Environmentally Controlled Conditions. Unpublished presentation to the 5th Annual International Symposium on Man and His Environment in Health and Disease, February 26/27, 1987, Dallas, Texas, USA;.

> This researcher reported a case history of an individual known to be sensitive to low levels of chemical exposures. Blood tests for pesticide content indicated high levels, which went down over six weeks in a controlled, chemically-less-contaminated environment. The patient was improved somewhat in a new, pesticide-free home, then became ill again. Tests showed improvement in symptoms when the lights, refrigerator and stove were off; controlled experiments with exposure to 60 Hz fields for 5-10 minutes produced symptoms. Similar exposure to 50 Hz fields eliminated the symptoms. The researcher concludes that massive pesticide exposures may render an individual not only chemically sensitive, but electromagnetically sensitive as well.

Rea, William J.; Dawkins Brown, Ollie (1987). Cardiovascular Disease in Response to Chemicals and Foods. Food Allergy and Intolerance, Section G, Chapter 42, pp 737 - 753; Brostoff, Jonathan and Challacombe, Stephen J. editors; Balliere Tindall, Publishers; 1987.

> A concept and method have now been established for the scientific definition of chemical and food triggering agents for inflammatory cardiovascular diseases including spastic vascular phenomena such as migraines and other vascular headaches, angina due to coronary spasm, Raynaud's disease, etc., many auto-immune vasculitides such as lupus, rheumatoid and other early collagen vasculitis, in addition to small and large vessel vasculitis, cardiac arrhythmias and non-traumatic phlebitis. There are now many articles in the scientific literature supporting the view that cardiovascular diseases can be caused by reactions to food and environmental irritants.

Rea, William J. (1987). Personal Interview, Dr. William Rea, Ottawa, Ontario. Personal Interview During the Canadian Society for Clinical Ecology and Environmental Medicine Conference, April 3, 1987.

The author suggests that the greatest benefit would be gained in the fight against building-related illness, by changing from the modern sealed building concept to buildings that allow open windows and greater individual control over fresh air.

Rees, David C.; Knisely, Janet S.; Balster, Robert L.; Jordan, Stephen; Breen, Timothy J. (1987). Pentobarbital-Like Discriminative Stimulus Properties of Halothane, 1,1,1-Trichloroethane, Isoamyl Nitrite, Fluorothyl and Oxazepam in Mice. Journal of Pharmacology and Experimental Therapeutics, Vol 241, No.2, pp. 507-515; 1987.

Volatile inhalants represent a diverse group of chemicals which pose a public health problem because of their abuse potential and neurobehavioural toxicity. They share certain properties with classic central nervous system depressants. Using drug discrimination procedures, the research showed that toluene, halothane, and 1,1,1-trichlorethane have pentobarbital-like discriminative effects.

Reible, Danny D.; Yonts, Paul; Shair, Fred H. (1985). The Effect of the Return of Exhausted Building Air on Indoor Air Quality. Air Pollution Control Association, 1985.

Reduced ventilation in order to improve the energy efficiency of buildings has resulted in the development of significant indoor air quality problems. The need for a balance between the competing objectives of low energy costs and good air quality are perhaps nowhere more evident than in chemical laboratories, where the potential for exposure to hazardous pollutants is very great. All too often, this need has been met through reductions in the overall ventilation of the building and a reliance upon individual laboratory fumehoods to achieve acceptable air quality. This approach is inadequate, in large measure due to the re-entry of as much as 10% of the exhausted pollutants into the building.

Reid, Lynne M. (1979). Session on Disease Conditions Predisposing Afflicted Individuals to the Toxic Effects of Pollutants: Introductory Remarks:. Environmental Health Perspectives, Vol. 29, pp. 127-129; 1979.

Children with bronchiolitis, with cystic fibrosis, or children who have had asthma during childhood or have developed hyperlucency in the radiograph after childhood infection, are all those in whom exposure to industrial irritants or to an inclement environment may be serious. The hazard of tobacco smoking is an extremely significant factor in the susceptibility of an individual to a pollutant.

Reinhardt, Charles F. (1978). Chemical Hypersusceptibility: Original Articles. Journal of Occupational Medicine, Vol. 20, No. 5, pp. 319-322; May 1978.

Occupational medicine is concerned with workers who react to certain substances at low levels, below the threshold concentration associated with injury or definite discomfort. These particular workers are distinctly more susceptible than the majority and may be inadequately protected by control procedures that will suffice quite well for most employees. Their hypersusceptibility may be inherited or acquired—if the latter, it may be primarily environmental, or it may be an interaction of several factors. Nutritional hypersusceptibility is indirectly traced to the environment.

Remafedi, Gary J. (1985). Adolescent Homosexuality: Issues for Physicians. Clinical Pediatrics, Vol. 24, No. 9, pp. 481-485; September 1985;.

Homosexuality identity formation is a potentially tumultuous process that begins in childhood and extends through adulthood. The adolescent's experiences may ultimately contribute to a variety of physical and mental health problems. Negative reactions of family and peers toward a person's homosexuality, damaged self-esteem, the desire to be with gay-identified peers, and exposure to street life are suggested as important factors predisposing homosexuals to a higher risk of involvement with prostitution, alcohol abuse and drug abuse. There is potential for intense family discord, and physical and/or emotional abuse when homosexuality is first revealed.

The authors offer guidelines for physicians caring for homosexual youths, and stress that information about sexual decision-making, personal hygiene, prevention of sexually transmitted diseases, and substance use, can literally be life-saving for the young homosexual. They caution the physician that it is advisable to avoid anecdotal information and interjection of personal biases when counseling young people and their families on the issue of adolescent homosexuality.

Repace, James L.; Lowrey, Alfred H. (1980). Indoor Air Pollution, Tobacco Smoke, and Public Health. Science, Vol. 208, pp. 464-472; May 2 1980; American Association for the Advancement of Science.

Indoor air pollution from tobacco smoke is pandemic. In the presence of tobacco smoke, many normal nonsmokers experience eye and throat irritation, headache, rhinitis and coughing; allergic persons report wheezing, sneezing and nausea as well. Particularly acute symptoms may be found in infants, children, persons with cardiovascular or respiratory disease and wearers of contact lenses. The authors undertook a systematic study of the levels of respirable suspended particulates in several common indoor environments. They showed that under the practical range of ventilation conditions and building occupation densities, the respirable suspended particulates levels generated by smokers overwhelm the effects of ventilation and inflict significant air pollution burdens. Smoking indoors may be incompatible with the goal of maintaining a high level of indoor air quality.

Repace, James L.; Ott, Wayne R.; Wallace, Lance A. (1980). Total Human Exposure to Air Pollution. Air Pollution Control Association.

A number of studies have shown that fixed monitoring stations do not accurately reflect the exposure of the population to outdoor pollutants in the indoor environment. Furthermore, various studies have indicated that indoor exposures to air pollutants can be very important contributors to air pollution burdens of the population. Factors affecting an individual's "exposure" are explored by modeling and measurement, and research needs and implications for regulatory action are discussed.

Repace, James L. (1981). The Problem of Passive Smoking. Bulletin of the New York Academy of Medicine, Vol. 57, No. 10, pp. 936- 946; December 1981.

Substantial new evidence concerning the adverse health effects of passive smoking have recently emerged. This new evidence indicates that well-known health effects of smoking may be suffered by nonsmokers who breathe tobacco-smoke-contaminated air. Concentrations of tobacco smoke indoors are directly proportional to the smoker density and inversely proportional to the effective ventilation rate. Attempts to control smoking by ventilation are futile, requiring ventilation rates far in excess of what is economical, and are contrary to the current trend toward energy conservation in buildings. However, alternative measures which reduce the source have been proved effective.

Repace, J.L.; Lowrey, A.H. (1982). Tobacco Smoke, Ventilation, and Indoor Air Quality. ASHRAE Transactions 88, part 1, pp. 895-914; American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1791 Tullie Circle NE, Atlanta GA 30329; 1982.

Cigarette smoking has been found to be causally related to cancer, cardiovascular disease, and pulmonary disease. Based on a 1,078,894 person prospective epidemiological study covering 25 states, statistically significant dose-response relationships between exposure to tobacco smoke and loss of life expectancy have been calculated. From examining the data according to mortality by degree of inhalation of tobacco smoke, it can be shown that a limited amount of exposure to tobacco smoke carries a greatly increased risk of premature mortality, a fact that has great relevance for the problem of passive smoking. Breathing of ambient tobacco smoke by nonsmokers carries a significantly increased risk of morbidity and mortality.

Repace, James L. (1983). Effect of Ventilation on Passive Smoking Risk in a Model Workplace. US Environmental Protection Agency, Washington DC 20460.

An estimate of the variation of nonsmokers' lung cancer risk from so-called passive or involuntary smoking is given as a function of ventilation rate in a typical office, at an occupancy of 7 persons/100 m-2 (per 1000 ft-2) as specified under ASHRAE Standard 62-1981, Ventilation For Acceptable Indoor Air Quality. Assuming one third of the office workers are smokers who smoke at the average rate of two cigarettes per hour, the nonsmoking office workers exposed to environmental tobacco smoke for a 40-year period under the ventilation rate recommended by the standard, would be subject to an estimated lifetime involuntary risk of about 250 per 100,000. This risk is 250 times the maximum lifetime value considered acceptable under commonly used environmental criteria for carcinogenic contaminants in air, water or food. Practical increases in makeup air or assists by air cleaning, although helpful, cannot reduce the risk to an acceptable level.

Repace, James L. (1983). Risks of Passive Smoking. University of Maryland, Center for Philosophy and Public Policy, College Park, Maryland 20742 USA; August 1983.

The risks to nonsmokers from breathing indoor air pollution from tobacco smoke are discussed from medical, legal, social, historical and philosophical points of view. Problems encountered by nonsmokers who are hypersensitive to tobacco smoke are contrasted with chronic risks to normal nonsmokers. Ambient tobacco smoke is compared to hazardous outdoor air pollutants and the products of other human activities which are regulated by society, and it is argued that failure to regulate indoor smoking will invite increasing confrontation and social dissention between nonsmokers, smokers and employers, since the nonsmoker's claim on clean indoor air is morally superior to the smoker's right to pollute.

Repace, James L.; Lowrey, Alfred H. (1983). Modeling Exposure of Nonsmokers to Ambient Tobacco Smoke. Air Pollution Control Association; August 1983.

The authors have modeled the exposure of the nonsmoking US population to the particulate phase of tobacco smoke from indoor air pollution in buildings. It was estimated that the average US nonsmoker of working age receives an exposure of 1.4 mg per day, a weighted average taken over exposures encountered both at home and at work. Estimates show that the ratio of workplace dose to the exposure received at home is nearly 4:1, indicating that, on the average, the workplace is a more important source of exposure than the home environment. Such estimates of exposure should prove useful both for assessing exposure in epidemiological studies of passive smoking, and for carcinogenic risk assessment, as well as for estimating total population exposure in epidemiological studies of the health effects of particulate air pollution.

Repace, James L.; Lowrey, Alfred H. (1984). A Proposed Indoor Air Quality Standard for Ambient Tobacco Smoke: from Indoor Air, Berglund, Lindvall, Sundell, editors. Swedish Council for Building Research, Stockholm Sweden; pp 235-239; 1984.

> The authors propose an indoor air quality standard for ambient tobacco smoke particles for a typical US workplace, based upon limiting the involuntary carcinogenic risk to a nonsmoker from passive smoking to 3 x 10-7 annually, corresponding to a 1 per 100,000 risk for a 40-year working life. To achieve this level of risk, the maximum permissible annual average of the daily workplace concentrations must be 0.75 micrograms per cubic meter. At typical smoking occupancies for an office, achieving the standard would require impractical amounts of ventilation or prohibitive costs for air cleaning equipment. It appears that complete physical separation of smokers and nonsmokers or prohibition or workplace smoking are the only practical control measures.

Repace, James (1984). Tobacco Smoke: The Double Standard. QQ—Report from the Center for Philosophy & Public Policy, University of Maryland, College Park, Maryland 20742; Vol. 4, No. 1, pp 6-8; Winter 1984.

> A research scientist blasts the double standard that treats air pollution more leniently when emitted from a lit cigarette than from a factory smokestack.

Repetti, Rena L. (1987). Individual and Common Components of the Social Environment At Work and Psychological Well-Being. Journal of Personality and Social Psychology, Vol. 52, No. 4, pp. 710 - 720; 1987.

> The social environment at work is related to the mental health of employees. Two components of a social environment were measured in a study: a common social environment, the social climate shared by employees in the same work setting, and an individual social environment, the social space surrounding one individual in the setting. The study averaged co-workers' ratings and individuals' own ratings of the social environment to individuals' self-reported psychological well-being. A group of 37 bank branches represented work environment and nonmanagerial personnel in the branches served as participants. Aggregate co-worker ratings of the common social environment were significantly correlated with individual depression and anxiety. However, an individual's perceptions appeared to mediate the social environment's impact. As hypothesized, well-being was more closely tied to the proximal individual social environment than to the common social environment.

Resin, Torjman, Sherri (1978). Mental Health in the Workplace. Canadian Mental Health Association; November 1978.

> The material was selected so as to constitute a core body of knowledge of both theory and practice on the subject of mental health in the workplace.

Rieber, Elaine R. (1984). The Question of Safety in Secondary School Science Laboratories. Canadian Council on Children and Youth, Ottawa Canada; May 1984.

> This paper was prepared in response to a 1983 letter from a secondary school teacher in Quebec concerning the issue of mercury vapour in science laboratories and its potential harmful effect on the health of children. It was concluded that there are no provincial regulations with respect to safety standards for secondary school science labs, and no systematic monitoring of safety conditions exists at any level.

Riesenberg, Donald E; Arehart-Treichel, Joan (1986). "Sick Building" Syndrome Plagues Workers, Dwellers. Journal of the American Medical Association; Vol. 255, No. 22, p. 3063; June, 1986.

> "Sick building" syndrome is increasingly becoming a valid diagnosis used to explain illness in occupants of energy-efficient, tightly-constructed office and residential buildings with artificial ventilation. Whether it be hypersensitivity pneumonitis, irritation from fiberglass or other chemicals, or lassitude, scientists working in this area predict that physicians are likely to see increasing numbers of patients who work and live in sick buildings. Increased awareness of climatic pathogens will be required because physicians are, on the whole, poorly informed about the relationship between workplace exposures and ill health.

Riley, E.C.; Murphy, G.; Riley, R.L. (1978). Airborne Spread of Measles in a Suburban Elementary School. American Journal of Epidemiology, Vol. 107, No. 5, pp. 421-432; 1978; Johns Hopkins University School of Hygiene and Public Health.

> A measles epidemic in a modern suburban elementary school in upstate New York in spring, 1974 is analyzed in terms of a model which provides a basis for apportioning the chance of infection from classmates sharing the same home room, from airborne organisms recirculated by the ventilating system, and from exposure in school buses. The epidemic was notable because of its explosive nature and its occurrence in a school where 97% of the children had been vaccinated. Many had been vaccinated at less than one year of age. The index case was a girl in second grade who produced 28 secondary cases in 14 different classrooms. Organisms recirculated by the ventilating system were strongly implicated. After two subsequent generations, 60 children had been infected, and the epidemic subsided. From estimates of major physical and biologic factors, it was possible to calculate that the index case produced approx. 93 units of airborne infection per minute. The exceptional infectiousness of the index case, inadequate immunization of many of the children, and the high percentage of air recirculated throughout the school, are believed to account for the extent and sharpness of the outbreak.

Riley, R.L. (1982). Indoor Airborne Infection. Environment International, Vol 8, pp 317-320, 1982.

> Airborne infection from person to person is an indoor phenomenon. The infectious organisms are atomized by coughing, sneezing, singing, and even talking. The smallest of droplets evaporate to droplet nuclei and disperse rapidly and randomly throughout the air of enclosed spaces. Droplet nuclei have negligible settling velocity and travel wherever the air goes. Measles and other childhood contagions, the common respiratory virus infections, pulmonary tuberculosis, and Legionnaires Disease are typically airborne indoors. In analyzing a measles outbreak, the probability that a susceptible person would breathe a randomly distributed quantum of airborne infection during one generation of an outbreak was expressed mathematically. Estimates of the rate of production of infectious droplet nuclei ranged between 93 and 8 per minute, and the concentration in the air produced by the index case was about 1 quantum per 5 m 3 of air. Control of indoor airborne infection can, according to the author, be approached through immunization, therapeutic medication, and air disinfection with ultraviolet radiation.

Rimland, Bernard; and Larson, Gerald E. (1981). Nutritional Approaches to the Reduction of Criminality, Delinquency and Violence. The Journal of Applied Nutrition, Volume 33, Numebr 2, 1981, pp. 116-133.

> The traditional approaches to the treatment of offenders, through counseling and psychosocial rehabilitation, have in repeated studies been found to be useless or counterproductive. These methods assume antisocial behaviour is primarily sociogenic in origin. The author presents another point of view, that much crime, particularly violent crime, is caused by biological malfunctioning of the brain. The strong association between learning disabilities and antisocial behaviour suggests that both learning problems and problems with the law may stem from a common cause - brain malfunction. Maternal smoking, poor nutrition, toxic metal and other chemical exposure, and food allergies are among the adverse factors considered as causes of brain malfunction in youth.

Rittfeldt, Lars; Sandberg, Maria; and Ahlberg, Mats S. (1984). Indoor Air Pollutants Due to Vinyl Floor Tiles. Proceedings, 3rd International Conference on Indoor Air Quality and Climate, held in Stockholm, Sweden, August 20-24, 1984. Volume 3: Sensory and Hyperreactivity Reactions to Sick Buildings, pp. 297-301.

> Most pollutants emitted from vinyl floor tiles are found to originate from the surface film and the patterned film used in the manufacturing of the tiles. These films are plasticized with butyl benzyl phthalate, which makes the tiles easy to clean. Butyl benzyl phthalate was shown to be contaminated with benzyl chloride and benzal chloride, compounds which

> are irritating to the eyes and respiratory mucosa and which also are carcinogenic. The concentrations in the films and in the vinyl floor tiles of these substances were measured and their emission rates from a newly produced tile were determined. The author suggests that the emission of benzyl chloride and benzal chloride from vinyl floor tiles plasticized with butyl benzyl phthalate may be a factor contributing to the irritations in so-called "temporary sick buildings".

Robbins, Albert F. (1987). Neurotoxic Effects of Pesticides Called Critical Risk to Health. American Academy of Environmental Medicine Newsletter, Volume 22, No. 1, p 6; Spring, 1987.

> The Center for Science in the Public Interest recently asserted that most health symptoms caused by pesticides are effects on the nervous system. In a petition to the US Environmental Protection Agency, CSPI was joined by the American Public Health Association, the American Psychological Association and 8 other groups to require that pesticides be evaluated for their neuro-toxic and neuro-behavioural effects.

Robertson, Leon S. (1986). Injury: from Handbook of Prevention; Edelstein, Barry A. and Michelson, Larry, editors. Plenum Press, New York, 1986; pp. 343 - 360.

> Injury is among the most important public health problems in terms of the numbers of people affected and severity in cases of permanent disability and death. About one third of the population of the US is injured severely enough in a year to report an injury in the National Health Survey. It is the fourth leading cause of deaths. Traditionally, injury prevention has been considered a problem of accident prevention, a supposition which contains several unfortunate implications that have tended to retard consideration of the full range of options available to prevent injuries or reduce their severity. The continued high injury rates associated with road vehicles, guns, farm machinery, sports equipment, cigarettes, and other consumer products are not for lack of knowledge of what can be done to sharply reduce them. For major gains to be made in injury control, the government must act to set standards for the distribution and use of potentially injurious products.

Robinson, Alan M.; Sheppard, Howard; and committee (1983). Child Abuse: Second Report on Family Violence:. Government of Ontario; December, 1983.

> The primary responsibility of children's aids societies must be the protection of children. Interprofessional cooperation is essential at all stages of a case of child abuse. The central child abuse register must be made more effective. Abusers should be charged under the criminal code and child welfare act. Public and professional awareness of child abuse must be increased. The movement towards Native autonomy in the provision of child welfare services must be accelerated. Research into the problem

of child abuse must be encouraged and funded. There is a particular need for long-term studies of abuse victims. Research into the environmental factors, including diet, that could affect the incidence of child abuse must also be conducted.

Rogers, Sherry A. (1986). Indoor Air Quality and Environmentally Induced Illness: A Technique to Evoke Chemically Induced Symptoms in Patients. IAQ'86, p 71 - 77; American Society of Heating, Refrigerating and AirConditioning Engineers, Inc.; 1986.

Formaldehyde is but one of many chemicals capable of causing environmentally induced illness. The spectrum of symptoms it may induce includes attacks of headache, flushing, laryngitis, dizziness, extreme weakness or exhaustion, inability to think clearly, arrhythmia or muscle spasms. The nonspecificity of such symptoms can baffle physicians from many specialities. Presented in this report is a simple office method for demonstrating that formaldehyde is among the etiologic agents triggering such symptoms. The very symptoms that patients complain of can be provoked within minutes, and subsequently abolished, with an intradermal injection of the appropriate strength of formaldehyde. This aids in convincing the patient that his symptoms can result from formaldehyde, one of the many triggers of environmentally induced illness. The patient can then begin to relate symptoms to environment exposures and initiate measures to avoid such triggers and bring his disease under control.

Root, David E.; Anderson, Joan (1986). Reducing Toxic Body Burdens: Advancing in Innovative Technique. Occupational Health and Safety News Digest, Vol. 2, No. 4; April, 1986.

Assessing and reducing chemical toxicity is of increasing interest to industry. Some corporations and medical advisors have developed policies emphasizing early detection and preventive measures. Case histories are presented where a regimen was employed which reduced body stores of some highly bioaccumulative substances, including organohalides such as polychlorinated biphenyls. It included aerobic exercise, polyunsaturated oil supplement, sauna, nutritional supplements, and water and salts taken as needed. The effect of this regimen was to enhance the mobilization of toxic substances from tissues.

Roy, Alan W. (1987). Letter from Union of Ontario Indians About Pollution of Ojibway Land. Personal Correspondence from Alan W. Roy, Environmental Director, Union of Ontario Indians, Toronto, Ontario.

The author cites the attitudes taken by the federal government and certain corporations, towards the Ojibway people (Anishinabek) and the pollution of their land, as contributing to an unhealthy environment for Ontario native people. In the 1950s, a sulphuric acid factory was built adjacent to an existing native community, within the Serpent River Indian Reserve, half-way between Sault Ste. Marie and Sudbury, on the

North Shore of Georgian Bay. In 1963, the factory was abandoned for economic reasons, leaving a toxic waste dump containing 120,000 tons of sulphur, calcine and pyrite which eventually contaminated soils over 100 acres of the reserve. (See also 'Cutler Acid Plant Study', Stokes, 1981.)

The Union of Ontario Indians suggests that the original cooperation by the Department of Indian Affairs to offer Reserve Land to industry, for such an environmentally deleterious operation, was indicative of an unhealthy attitude, at that time, towards Ontario's aboriginal people. They charge that 30 years of delay in working out financing for an appropriate rehabilitation program (estimated at $2 million) is proof that this attitude has persisted. The author speculates that if this situation existed in Southern Ontario, with a constituency of the dominant society middle class Ontarians, the site would have been rehabilitated much more quickly.

Sachs, H.M.; Hernandez, T.L.; Ring, J.W. (1982). Regional Geology and Radon Variability in Buildings: from Indoor Air Pollution; Spengler, John—editor. Environ. Int., Vol. 8, No. 1/6, pp. 97-103; 1982; Pergamon Press Ltd., Oxford, Toronto.

Radon concentrations in dwellings vary by more than two orders of magnitude. Predicting where and when concentrations are likely to be high requires studying the variability of the contributors to radon in buildings. Among common sources, geological factors (water supply and substrate) are the most variable, whereas building materials are much less variable. Ventilation variation among houses is generally responsible for radon variations comparable to those introduced by building materials, but it is more significant at lower ventilation rates. In some regions with relatively high proportions of houses with elevated radon concentrations, mappable geological factors are associated with most cases of high radon concentrations.

Saegert, Susan (date?). Crowding: Cognitive Overload and Behavioral Constraint. Environmental Design Research, Vol. 2; pp 254 - 260.

Hypotheses concerning cognitive and behavioral effects of crowding are developed by looking separately at its two physical components: number of people in a space and amount of space per person. The first would tend to increase cognitive complexity and uncertainty in the situation and the difficulty of organizing behavior. The second would make others in the situation more salient as stimuli and require greater coordination of behavior. Together these factors would tend to produce cognitive overload and behavioral constraint. Supporting results from an exploratory study conducted in a mid-Manhattan department store are reported.

Saegert, Susan (undated). High Density Environments: Their personal and Social Consequences. Human Responses to Crowding, Lawrence Erlbaum Associates, Norwood, NJ; Baum, A.; Epstein, Y., editors.

> Many studies have been undertaken which make it clear that high-density experiences and living conditions can provoke stress and anti-social behaviours and attitudes. But other studies present contradictory findings. There is no such thing as density per se. The term refers to people living in and moving through certain amounts of space that varies in configuration, definition and types of interpersonal interaction as well as perception on the part of the people involved. Since high density systems seem to require more from people, economic, health and social disadvantages appear to take more of a toll in these environments, although the many opportunities provided may at times offset such problems. Some implications for physical design and planning of high density environments are given which include conducting investigations of standing patterns of social relations and activity systems prior to planning; constructing facilities and policies to either support or develop affinity groups and patterns of behaviour that have existed in other situations; definition of manageable-size groups and provision of flexible shields from interaction for groups and individuals; and provision for acccess to lower density environments for individuals during the course of their normal life activities. An excellent bibliography is included.

Saegert, Susan; Winkel, Gary (date?). The Home; A Critical Problem for Changing Sex-Roles. Unpublished.

> The home is a significant physical and symbolic environment for both men and women. The activity patterns of women, especially mothers of young children, are strongly influenced by the home's location, as well as the women's sense of options and feelings about their identity. Urban men appear to be less emotionally invested in the home than their wives; suburban men are happier in suburban homes. This raises questions for women who want their homes to be meaningful centres of the family and who want to expand their roles outside the home. If women are to expand their roles outside the home, a wide range of home-related activities and values must be changed in some way. Higher density, mixed-use residential environments give women more options. The time schedule and reward structure of most work is one of the strongest pressures against the combination of physical and psychological investment in the home and outside. The geographic segregation of residential environments from public life reinforces the cultural choice of work or home, especially for women, who do not have the luxury of a wife.

Saegert, Susan (1975). Stress-Inducing and Reducing Qualities of Environments. Environmental Psychology, 2nd edition; Proshansky, H.M. Ittelson, W.H., and Rivlin, L.G. editors; Holt, Rinehart & Winston; 1975.

Environments can both induce and reduce stress. Stress-inducing environments include those which are physically threatening, noisy and polluted. These environmental stressors have not been extensively investigated, and never in the context of their full complexity. Stimulus or information overload is also a stress-provoking quality of environments, as is decisional overload which results from a person's relationship to the environment. This combination of physical environment and psychosocial orientation contributes to the dimension of experience in cities which is referred to as the pace of life. Also to be considered are the suitability of an environment for the particular people and the activities that engage them (the frustration experienced by commuters in a hurry to get home but tied up in traffic or by children wanting to play in high-rise buildings which prohibit such activity) and the psychologically and socially meaningful messages associated with particular physical environments (people experiencing increased status become healthier and those whose educational or class background exceed their current status are less healthy than others in the same circumstances). Implications for stress-reducing environments are discussed. An extensive bibliography is included.

Saegert, Susan (1980). Masculine Cities and Feminine Suburbs: Polarized Ideas, Contradictory Realities. Signs: Journal of Women in Culture and Society, Vol. 5, No. 3 suppl. pp s96 - s111; 1980.

A wide range of symbolic associations attach to women and suburbs versus men and cities. Urban life and men tend to be thought of as more aggressive, assertive, definers of important world events, intellectual, powerful, active, and sometimes dangerous. Women and suburbs share domesticity, repose, closeness to nature, lack of seriousness, mindlessness, and safety. The growth of suburban populations during a time of increased female labour force participation can be added to a list of contradictory trends in this era that place rather greater demands on women. Many now have two roles — work outside the home and responsibility for domestic life. The public services that might help women manage are not given priority by suburbs which operate under the myth of the housewife in an effort to preserve class and racial exclusiveness. Higher density, mixed-use residential environments give women more options. Collective visions of an integrated life of domestic work, productive work, and leisure must inform public policy and physical planning in order to bring forth an organization of time and space in which that integration is fostered.

Saegert, Susan (1981). Environment and Children's Mental Health: Residential Density and Low Income Children. Handbook of Psychology and Health, Volume 2; Erlbaum Associates; 1981; Baum, A.; Singer, J., editors.

A review of research on children and density is presented, along with a description of recent research conducted by the author which examines the influence of residential crowding and high rise living on children's health and psychological development. Higher levels of occupancy and interaction in high density apartments result in more frequent conflicts

between children. In large buildings, children have more difficulty in accurately conceptualizing the larger buildings and know proportionally fewer people, which leads to perceptions of less friendliness among tenants, less likelihood of aid being offered, and less guilt among children about committing antisocial acts.

Salvaggio, John E. (1986). Human Symptomatology and Epidemiology of Fungi in Air. Significance of Fungi in Indoor Air, Part II, Working Papers; Health and Welfare Canada Working Group on Fungi and Indoor Air; March, 1986.

This report covers occupational and environmental problems due to air exposure to fungal contamination. It includes a discussion of relevant clinical data on patients, specific measurements made with air sampling devices, the importance of particle size, and lung biopsy data where appropriate. An exhaustive bibliography is included.

Sandia National Labs (1982). Indoor Air Quality Handbook: For Designers, Builders, and Users of Energy Efficient Residences. US Govt.; NTIS DE83002315; Sept. 1982.

Keywords: indoor air pollution; residential buildings; air pollution control; energy efficiency; pollution sources; radon; ventilation; formaldehyde; carbon monoxide; nitrogen oxides; organic compounds; smokes; low pollution design

Sarason, Irwin G.; Spielberger, Charles D. (1983). Stress and Anxiety: Volume 6. Hemisphere Publishing Corporation; 1983.

A concern with life crises and with the stress and anxiety generated by such crises projects the concept of environmental security into a prominent place in the person-environment conceptual framework. This concept expresses the affective correlates of individuals' degrees of competence, control, and knowledge in relation to their physical worlds. To have such control, understanding, and competence are matters of critical importance to a person's self-identity and related feelings of self-esteem. Physical settings, however, because of their frequently growing complexity and accelerated change, increasingly make demands on people to the extent that the pursuit of environmental security in an urban context becomes an unending process for urban dwellers.

Saric, Marko; Fugas, Mirka; Hrustic, Omer (1981). Effects of Urban Air Pollution on School-Age Children. Archives of Environmental Health, Vol. 36, No. 3, pp. 101-108; 1981.

From November 1977 to March 1978, forced expiratory volumes (FEVs) of 78 second graders living in a high sulfur dioxide and smoke pollution area were compared with FEVs of 70 second graders living in a clean air area.

The incidence of acute respiratory diseases in these children and their families was also comparatively studied during the same period. Indoor and outdoor measurements of sulfur dioxide and smoke, as well as additional measurements of suspended particulate matter (SPM) and sulfate were conducted. The results of the study suggest that at the actual average annual exposure to sulfur dioxide, smoke, and SPM of 70-80 ug/m 3, 60-80 ug/m 3, and 130-200 ug/m 3, respectively, with frequent exposures to three to five times higher daily sulfur dioxide and smoke concentrations and two times higher daily concentrations of SPM during the heating season, certain effects on the ventilatory functions and occurrence of acute respiratory diseases can be expected.

Sass, Robert (1986). Workplace Health and Safety: Report from Canada: Original Articles on Occupational Health Policy. International Journal of Health Services, Volume 16, Number 4, 1986; pp 565 - 582; Baywood Publishing Co., Inc.

This article represents a critical analysis of the major policy responses to workplace health and safety in Canada. It examines the deficiencies inherent in the legislative development of Joint Health and Safety Committees in most Canadian jurisdictions, the limitations regarding standard-setting of worker exposure to contaminants, and disincentive for employers to positively improve the workplace because of Workers Compensation legislation. Collective bargaining agreements in Canada have had only limited positive effects, while the ultimate legal sanction of criminal prosecution by the regulatory agencies has weakened enforcement and compliance of existing regulation. There has never been a successful criminal prosecution of an employer in Canada, even for multiple deaths.

Four reasons are suggested: the concealment of the dimension of the incidence of industrial disease based on Workers Compensation Board statistics; the application of an incorrect theory of causation of both industrial disease and injury by both managers and government administrators of occupational health and safety programs; the resistance of both senior and middle managers against increased worker participation in both work organization and job design questions; and the general moral underdevelopment rather than ignorance of managers in favouring economic considerations or values at the expense of worker health and safety. The author proposes the need for greater workplace democratization of production and industry as a necessary and sufficient reform of workplace health and safety.

Savitz, David A.; Calle, Eugenia E. (1987). Leukemia and Occupational Exposure to Electromagnetic Fields: Review of Epidemiologic Surveys. Journal of Occupational Medicine, Vol. 29, No. 1, pp 47 - 51; January, 1987.

Several recent surveys have presented data suggesting an increased risk of leukemia among men with occupational exposure to electromagnetic fields. Eleven pertinent data sets were compiled in order to assess the consistency of this pattern and to identify those occupations most deserving closer examination. Results for total leukemia show a modest excess risk for men in exposed occupations, with an enhanced risk elevation for acute leukemia and especially acute myelogenous leukemia. These studies are inherently limited regarding the effect of electromagnetic fields due to the absence of exposure characterization. Nonetheless, telegraph, radio, and rador operators, power and telephone linemen, and electrical and electronic engineers showed the most consistent results and warrant further study to ascertain potential occupational health hazards.

Savitz, David A.; Calle, Eugenia E. (1987). Leukemia and Occupational Exposure to Electromagnetic Fields: Review of Epidemiogical Surveys. Journal of Occupational Medicine, Volume 29. No. 1, January 1987; pp. 47-51; American Occupational Medicine Association;.

This review compiled eleven sets of data from previous study to assess leukemia risk among men with occupational exposure to electromagnetic fields. Results for total leukemia show a modest excess risk for men in exposed occupations, with an enhanced risk elevation for acute leukemia and especially acute myelogenous leukemia. The studies lacked characterization of the electromagnetic exposure. Nevertheless, telegraph, radio and radar operators, power and telephone linemen, and electrical and electronic engineers showed the most consistent results. The authors caution that the available data are inadequate to conclude that electromagnetic field exposures are the reason for that elevation, and they suggest further study to ascertain potential occupational health hazards.

Scadding, Glenis K.; Brostoff, J. (1986). Low Dose Sublingual Therapy in Patients With Allergic Rhinitis Due To House Dust Mite. Clinical Allergy, Vol. 16, pp 483-491; 1986.

In a double-blind placebo-controlled trial, low dose sublingual therapy with house dust mite was effective in relieving symptoms in 72% of the group of patients with perennial rhinitis due to house dust mite. Following active treatment, there was a significant increase in morning peak nasal inspiratory flow rate in those who improved and resistance to nasal provocation with house dust mite also increased, in some cases up to 1000-fold. Oral therapy is safe and avoids the side effects of desensitizing injections which can be serious. The potential for oral desensitization is great and further studies on this form of treatment are needed.

Schaumburg, Herbert; Spencer, Peter S. (1978). Environmental Hydrocarbons Produce Degeneration in Cat Hypothalamus and Optic Tract. Science, Vol. 199, pp. 199-200; January 1978.

Keywords: environmental hydrocarbons; animal studies; health effects;

Schauss, Alexander (1980). Diet, Crime and Delinquency. Parker House, Berkeley CA 94704; 1980.

> Junk food diets, sugar starvation, vitamin deficiencies, lead pollution; and food allergies can convert a normal brain into a criminal mind. Children absorb and retain a greater percentage of ingested lead than adults. Lead levels formerly considered safe have recently been shown to increase abnormal behaviour, cause learning difficulties and reduce intelligence.

Schauss, Alexander (1980). Lead, Behaviour and Criminality: from Diet, Crime and Delinquency; chapter 111; pp. 32-49. Parker House, Berkeley CA; 1980.

> Lead levels formerly considered safe have recently been shown to increase abnormal behaviour, cause learning difficulties and reduce intelligence. Children can absorb enough lead to impair their performance on tests of reasoning, coordination, intelligence and reading. Some symptoms of lead toxicity are: hyperactivity, perceptual disorders, mental retardation, fatigue, irritability, temper tantrums, learning disabilities, speech disturbances, perceptual motor dysfunctions, and emotional or behavioural problems. There are two new techniques helpful in determining heavy metal concentrations, replacing blood tests. These are hematofluorometry and hair trace mineral analysis.

Schiefer, H.B. (1985). Health Effects from Mycotoxins (volatile or absorbed to particulates): A Review of the Relevant Data in Animal Experiments. University of Saskatchewan; December 1985.

> Assuming that it is correct that potentially toxigenic fungi can be isolated from dust in indoor polluted homes, and given the clinical descriptions of health problems of inhabitants of such dwellings, it is possible to hypothesize that the health problems encountered are due to trichothecene mycotoxins. The subtle effects on the immune system will, however, be masked by the more obvious clinical and pathological findings of an opportunistic infection, thus escaping the attention of clinicians. There is a chance that an aero-allergenic reaction is taking place due to the proteins contained in the dust or associated with the fungal spores or other inorganic material or chemicals. The question should be pursued with care and priority.

Schlesinger, Richard B. (1985). Effects of Inhaled Acids on Respiratory Tract Defense Mechanisms. Environmental Health Perspectives, Vol. 63, pp 25 - 38; 1985.

> The respiratory tract is endowed with an interlocking array of non-specific and specific defense mechanisms which protect it from the effects of inhaled microbes and toxicants, and reduce the risk of

absorption of materials into the bloodstream. Ambient acids may compromise these defenses, perhaps providing a link between exposure and development of chronic and acute pulmonary disease. This paper reviews the effects of inhaled acids upon the nonspecific clearance system of the lungs. An extensive bibliographic list is included.

Schnare, David W.; Ben, Max; Shields, Megan G. (1984). Body Burden Reductions of PCBs, PBBs and Chlorinated Pesticides in Human Subjects. Ambio, A Journal of the Human Environment, Vol. 13, No. 5-6; pp 378 - 380; 1984.

With human exposure to environmental contaminants inevitable despite the best application of environmental laws and protection technologies, interest has grown in the potential to reduce the levels of contamination carried in the human host. This study demonstrates the promise of a comprehensive treatment for reduction of body burdens of polychlorinated and polybrominated biphenyls and chlorinated pesticides. Adipose tissue concentrations were determined for seven individuals accidentally exposed to PBB. These patients underwent detoxification treatment to eliminate fat-stored foreign compounds. Of the 16 organohalides examined, 13 were present in lower concentrations at post-treatment sampling. 7 of the 13 reductions were statistically significant. To determine whether reductions reflected movement to other body compartments or actual burden reduction, a post-treatment follow-up sample was taken four months later. Analysis showed a reduction in all 16 chemicals. Future research stemming from this study should include further investigation of mobilization and excretion of xenobiotics in humans.

Schrecker, T.F. (1984). Political Ecomony of Environment Hazards: Protection of Life Series, Study Paper. Law Reform Commission of Canada; 1984.

'Political' should be taken to not only include the actions of elected officials and bureaucrats, but also the process of selecting the issues and defining the alternative courses of action which are considered by these and other actors. The law itself will usually reflect similar mobilizations of bias. This paper deals both with the process by which environmental hazard law and policy are made and with the conceptual frameworks which are used to define objectives and strategies for controlling environmental hazards. Also examined is the role of the large profit-oriented corporation as a policy-making institution. The system of property rights which allows business relatively unfettered control over investment flows, on the basis of maximizing profitability, seriously restricts the ability of governments to intervene in many kinds of decisions which are now the prerogative of the corporation.

Schreiter, Anne (1984). Human Ecology in the Schools. Human Ecology Foundation of Canada, Kitchener Branch.

This article outlines causes of and solutions for chemically sensitive children in the school system. Suggestions are made for reducing the chemical load of the children and teachers and solutions are presented that have been used in actual situations of chemical sensitivity.

Schreiter, Anne (1984). A Follow-up to Human Ecology in the Schools. The Human Ecology Foundation of Canada, Kitchener Branch.

> Suggestions and solutions for chemically sensitive children in the school system. Suggestions are made for reducing the chemical load of the children and teachers, including that smoking be banned on school property.

Schroeder, Henry A. (1973). Cadmium, High Blood Pressure and Water. from Trace Elements and Man; chapter VIII, pp. 97-114; Devin-Adair Co.; 1973.

> There is evidence that cadmium from refined foods, water pipes and contaminated air and water accumulates in human kidneys and causes hypertension or high blood pressure.

Scott, P.M. (1986). Mycotoxins Produced by Certain Fungi Associated with Thermal Insulation. Significance of Fungi in Indoor Air, Part II, Working Papers; Health and Welfare Canada Working Group on Fungi and Indoor Air; March, 1986.

> Mycotoxins associated with thermal insulation are described in detail. An exhaustive bibliography is included.

Scott, Peter M. (1983). Other Mycotoxins. Proc. Int. Symp. Mycotoxins, pp. 87 - 110; 1983.

> With the exclusion of the aflatoxins, fusarium toxins, and penicillium toxins, the remaining known mycotoxins are produced by fungi of the genera Aspergillus, Alternaria, Trichothecium, Stachybotrys, Myrothecium, Claviceps, Deplodia, Chaetomium, and over a dozen others. Natural occurence has been demonstrated for some in foods or agricultural commodities as a result of fungal infection. The epidemics of human ergotism in Europe in medieval times, more recent incidences in India, and many diseases in animals, are attributable to these toxins. An excellent bibliography is included.

Seguin, Marilynne (1987). Dying With Dignity: A Canadian Society Concerned with the Quality of Dying. Dying With Dignity; 1987.

> Dying With Dignity is a charitable, volunteer organization that believes people should have the right to control the ending of their own lives. This includes the right to voluntary euthanasia, suicide, and to refuse treatment. It is based on the concern of many people that modern technology has made it possible to keep people alive past the point at which life has ceased to be worth living.

Seifert, Bernd; Drews, Marianne; Aurand, Karl (1984). Indoor Heavy Metal Exposure of the Population Around a Secondary Lead Smelter: Buildings, Ventilation and Thermal Climate; Berglund, Birgitta; Lindvall, Thomas; Sundell, Jan — editors. Indoor Air, Vol. 2, pp. 177-181; Swedish Council for Building Research, Stockholm Sweden, 1984.

> In the course of earlier studies, it had been observed that measuring the concentration of heavy metals in deposited dust is a much better means to characterize the exposure of population groups living close to emission sources than analysing samples of suspended particulate matter. Thus, a simple method has been developed in which house dust collected with a passive sampler is used for a rapid screening of the heavy metal content of dust deposited in houses located near a source. Analysing such dust samples for lead and cadmium permitted the authors to detect the most polluted spots in an area surrounding a secondary lead smelter at Oker, Federal Republic of Germany. The method as well as the results of field measurements carried out in 1982 are discussed.

Selikoff, Irving J. (1975). Investigations of Health Hazards in the Painting Trades: Final Report. City University of New York, Mount Sinai School of Medicine, Environmental Sciences Laboratory, New York NY; December 5 1975.

> Keywords: occupational health and safety; painting; air pollution; health hazards;

Selner, John C.; Stuadenmayer, Herman (1986). The Relationship of the Environment and Food to Allergic and Psychiatric Illness. Psychobiological Aspects of Allergic Disorders; chapter 6, pp 102 - 146; Praeger Publishers; 1986; Young, Stuart H., Rubin, James M., Daman, Harlan R., ed.

> Patients with environmental illness are described, as are methods for diagnosis and treatment. Foods and chemicals can cause acute and chronic symptoms previously viewed as expressions of somatoform disorders by most physicians. Environmental Care Units, isolated facilities which screen out known chemical irritants and sensitizers, are described as useful treatment facilities and as a means of separating patients with ulterior motives from those with environmental illness.

Selye, Hans (1976). Stress: Its Relationship to Man and his Environment. Health Promotion Through Designed Environments, pp 107 - 126; Health and Welfare Canada, Health Programs Branch; October, 1976.

> The unprecedented development of technology in this century has created many new sources of stress: pollution of the atmosphere by chemicals and noise, the speed of industrial life, fear of atomic war, etc. The manifestations of stress and techniques for reducing it are presented.

Seppalainen, Anna Maria; Harkonen, Hannu (1976). Neurophysiological Findings Among Workers Occupationally Exposed to Styrene. Scand. j. work environ. & health, No. 3, pp. 140-146; 1976.

> Keywords:styrene; electroencephalography; encephalopathy; electroneuromyography; mandelic acid; occupational health and safety;

Severs, Richard K. (1980). Air Pollution and Health. from Environment and Health, chapter 5, pp. 123-162; Trieff, Norman M. editor; Ann Arbor Science Publishers Inc.; 1980.

> Synergistic effects of pollutants have been demonstrated. Air pollution aggravates existing disease conditions or puts at higher risk those predisposed to ill health. Nonspecific measurements of air pollutants that are associated with disease states in humans should be treated as though they were surrogates for causal factors. Little relevance comes from studies that expose humans to only one pollutant at a time. Adverse effects of the following air pollutants on the cardiopulmonary system are chronicled: sulfur dioxide, nitrogen dioxide, photochemical oxidants, carbon monoxide, hydrocarbons, and carcinogens.

Seyal, A. Rashid; Awan, M. Hayat; Mumatz, Hussain (date?). Premature Ventricular Contractions: The Relationship of Synthetic vs Natural Fabrics Worn Next to the Skin. Clinical Ecology, Vol. IV, Number 4, pp 149 - 154.

> Variations in the frequency of premature ventricular contractions (PVCs) with change in the type of garments were evaluated in 16 subjects who had no evidence of systemic or cardiovascular disease. These subjects, wearing either synthetic or cotton garments, underwent three programmable ambulatory electrocardiograph recordings to achieve a one hour trace within 24 hours. "Within subjects" the reduction in frequency of PVCs was 59 to 100%, whereas "within days" this reduction was 80 to 96%. With pooled data, the major variation in the PVC frequency occurred "within subjects" wearing synthetic garments. However, with cotton clothing this contribution was reduced by 50%. The results also show that the random contribution to PVCs attributed to unavoidable sources is much higher with cotton (50%) than with synthetic garments, the contribution of which was negligible.

Shah, Chandrakant P.; Farkas, Carrol Spindell (1985). The Health of Indians in Canadian Cities: a Challenge to the Health Care System. Can Med Assoc Journal, Vol 133, pp 859 - 863; November 1985.

> It is well known that Canadian native people living on reserves have high morbidity and mortality rates, but less is known about the health of those who migrated to urban centres. Several studies have shown that these people have high rates of mental health problems, specific

diseases, injuries, infant death and hospital admission. In addition, there is evidence that cultural differences create barriers to their use of health care facilities. The low socioeconomic status, cultural differences, and discrimination that they find in cities are identified as the primary blocks to good health and adequate health care. More epidemiologic studies need to be done to identify health problems, needs and barriers to health care. Federal, provincial and civic governments along with the appropriate departments of faculties of medicine should begin working with native organizations to improve the health of native people living in Canada's cities.

Shain, Martin (1982). Alcohol, Drugs and Safety; An Updated Perspective on Problems and Their Management in the Workplace. Accid. Anal. & Prev., Pergamon Press Ltd., Vol. 14, No. 3, pp 239-246.

The relationship between alcohol, drugs and accidents in the workplace is explored in the context of available evidence, the balance of which suggests that the contribution of substance abuse and misuse to personal injury and property damage losses has been underestimated. Recommendations are made requiring a more complete data base be developed in this area. Necessary steps are seen as: 1) conducting independent prevalence surveys of alcohol and drug use in specific work organizations; 2) relating this information to safety-related behaviour as monitored through observation and interviews and searches of official records, in particular Workmen's Compensation files. Also, it is suggested that the relationships between the management of alcohol and drug related problems and the management of safety be more closely coordinated. The emphasis, however, should be as much on heavy drinking as on alcoholism, and as much on inappropriate prescription use of drugs as on illicit drug abuse.

Shakman, Robert A. (1974). Nutritional Influences on the Toxicity of Environmental Pollutants: A Review. Arch Environ Health, Vol. 28, pp. 105-113; February 1974.

Keywords: nutrition; air pollution; toxicity; health effects;

Sharp, Dan S.; Eskenazi, Brenda; Harrison, Robert; Callas, Peter; Smith, Allan H. (1986). Delayed Health Hazards of Pesticide Exposure. Ann. Rev. Public Health, No. 7; pp. 441 - 471; 1986.

The delayed health hazards of pesticide use have been difficult to detect. The need continues for surveillance and assessment of delayed health effects from pesticide exposure. Evidence is presented for pesticides causing various cancers, deleterious reproductive outcomes, and subtle neurologic sequelae. Epidemiologic evidence provides the focus, but pertinent animal and clinical research is also presented. Studies of farmers and pesticide users are presented in detail as are studies linking phenoxy herbicides, chlorophenols, dioxins, and amitrole with mesenchymally derived tumors in Sweden, American chemical manufacturing facilities, New Zealand, and with Vietnam veterans. Other evidence links arsenic and organochlorine pesticides to cancer in humans. Reproductive hazards have been found to result from exposure to DBCP, and there are unconfirmed suspicions that exposure to DDT and the phenoxy herbicides may be associated with congenital malformations. The nervous system has been recognized as a target organ for pesticide toxicity for several decades.

Shearer, Ruth (1983). On Safe Use of Pesticides. author; 1983.

The idea that people can be exposed to pesticides safely is based on a number of faulty assumptions. These include: pesticides registered with the government have passed stringent health testing; a no-observable-effect level can be determined for any pesticide; pesticides are safe when used according to the label; after a pesticide has been excreted from the body, all poisoning symptoms are gone.

Shearer, Ruth W. (1983). Health Effects of 2,4-D Herbicide. author; April 1983.

The author is familiar with the medical histories of more than 30 people who have been acutely poisoned by 2,4-D alone or in combination with other herbicides. Acute symptoms include nausea, vomiting, diarrhea, headache, temporary loss of vision, weakness, burning eyes, sore throat with burning in chest, and difficulty in thinking. Residual effects include impairment, bleeding tendency, concentration and memory problems, and hypersensitivity to non-physiologic chemicals which prevents participation in most modern job environments. Likely carcinogenicity is discussed in detail, including a discussion of recent animal studies.

Sheehy, Noel P.; Chapman, Antony J. (1985). Adults' and Children's Perceptions of Hazard in Familiar Environments. Children Within Environments, Chapter 4, pp 51 - 63; Garling, Tommy and Valsiner, Jaan editors; Plenum Press; 1985.

Children's accidents constitute an endemic social problem of epidemic proportions. This chapter examines the relationship between children's and adults' perceptions of hazard and accident liability. Two studies are described which question the presumption that adults comprehend the child's perspective and empathize with the child which have traditionally governed safety campaigns and educational measures. Future research should consider how hazard identification, tactical responding, and knowledge of personal limitations interact, and how independently and jointly they may precipitate an accident. Extensive references are included.

Shifrin, L. (1987). The Changing Face of Poverty. Toronto Star, November 30, 1987.

> The author quotes Statistics Canada figures showing the proportion of Canadians in poverty to be 14.9 percent in 1986. He notes that the percentage of mother-led households among those below poverty-level incomes had increased from 9.9% to 12.7% since 1979. The poverty rate among single-parent families headed by women had risen from 55.4% to 56.1%, while the number of families had continued to grow.

Shy, Carl M.; Creason, John P.; Pearlman, Martin E.; McClain, Kathryn E.; Benson, Ferris B.; Young, Marion M. (1970). The Chattanooga School Children Study: Effects of Community Exposure to Nitrogen Dioxide: 1. Methods, Description of Pollutant Exposure, and Results of Ventilatory Function Testing. Journal of the Air Pollution Control Association, Volume 20, No. 8, pp. 539-545; August 1970.

> Elementary schools in four areas of Chattanooga Tennessee USA were selected for a study of the effects of community exposure to nitrogen dioxide. One area, in close proximity to a TNT plant, had high NO2 exposure, another had relatively high suspended particulate exposure, and two areas served as "clean" controls. The similarity of the economic levels of high NO2 and control areas and moderately lower economic level of the high particulate area were documented. Ventilatory performance of second-grade school children in the high NO2 exposure area was significantly lower than the performance of children in the control area. The data suggested that ventilatory performance was adversely affected when an NO2 threshold was exceeded but that above this threshold no further impairment of performance could be detected.

Silberstein, Samuel (1979). Heating System-Generated Indoor Air Pollution. Energy and Buildings, Vol. 2, No. 4, pp. 271-278; Dec. 1979; Elsevier Sequoia S.A., Lausanne Switzerland.

> Keywords: buildings; space heating; air pollution; energy conservation; indoor air pollution;

Silberstein, Samuel (1979). Energy Conservation and Indoor Air Pollution. Energy and Buildings, Vol. 2, No. 3, pp. 185-189; August 1979; Elsevier Sequoia S.A., Lausanne Switzerland.

> Keywords: buildings; energy conservation; air pollution; ventilation; indoor air pollution; air exchange;

Silver, Francis (1976). More on the Plastic Problem. Ecologist, p. 9, 1976; Environmental Health Assoc. of Greater Washington, Box 3162, Falls Church VA 22043.

> Many people experience burning sensations, loss of attention and drowsiness when sitting on plastic chairs. It is possible that incidences of misbehavior by children such as wrecking school buses, hyperactivity and learning difficulties may be all be influenced by exposure to tri-cresyl phosphate in the vinyl seating of the buses, school seats or cleaning agents.

Silver, Francis (1976). Carbon Monoxide. from Clinical Ecology, Dickey, Lawrence D., ed.; pp. 269-272; Charles C. Thomas; 1976.

> Easily measurable impairment of some of the more delicate senses can be measured at 1% or 2% of hemoglobin bound by carbon monoxide. This blood level can result from five to ten parts per million in the breathed air. At 3% to 5% carboxyhemoglobin, ordinary intellectual functioning starts to suffer in a way that can be measured. Creativity and finer intellectual coordination may be harmed at much lower levels. It is difficult to measure and document such low levels of impairment to intellectual functioning, coordination and creativity, hence the many studies claiming to report "no effect" after heavy CO exposure.

Silver, Roxame, L.; Wortman, Camille B. (1980). Coping With Undesirable Live Events. Human Helplessness; Academic Press; Garber, J., Seligman, Martin E.P., editors; pp 71 - 95; 1980.

> This is a study of how people cope with stressful life events which deals with the following questions: Are there any reactions that are universally experienced? Do persons who encounter different life crises show similarities in response? Do people progress through an orderly sequence of stages as they attempt to cope? Is it true that with time, people accept or recover from their crisis and move on? What is successful adjustment? Outsiders frequently underestimate the nature and duration of the distress and individuals are likely to hold unrealistic expectations to their own responses which may serve to intensify their distress. Health care professionals must legitimize the feelings and reactions that commonly occur among people who have encountered negative life events in order to assist them to cope. Outsiders must be sensitive to the fact that for most people, an aversive life event is never really forgotten. The transient return of unresolved feelings must not be viewed as an indication of instability or mental illness but as an acceptable way of living with the crisis. Further research is needed. An extensive bibliography is included.

Silverman, Frances (1979). Asthma and Respiratory Irritants (Ozone). Environmental Health Perspectives, Vol. 29, pp. 131-136; 1979.

> Asthmatics appear to be more susceptible to the effects of air pollutants than nonasthmatics. The present studies were undertaken to examine the effects of exposing asthmatics to ozone concentrations that occur in the environment and indicate that acute exposures to ozone at realistic concentrations in the environment can produce adverse responses in some asthmatics.

Silverman, F.; Corey, P.; Mintz, S.; and Hosein, R.H. (1985). Factors That Influence Assessments of Health Effects of Air Pollution. Proceedings, 3rd International Conference on Indoor Air Quality and Climate, held in Stockholm, Sweden, August 20-24, 1984. Volume 4: Chemical Characterization and Personal Exposure, pp. 123-127.

> Scientists at the Gage Research Institute, University of Toronto examined the health effects of air pollution in asthmatics and healthy non-asthmatics. The study took into account the fact that the indoor environment may be a modifier of human exposure to air pollution, by using small portable multi-pollutant samplers for nitrogen dioxide, sulphur dioxide, and particulate matter.

Simard, Monique (1986). The Reduction and Rearrangement of Worktime: A Priority and a Challenge: A New Work Agenda for Canada. Canadian Mental Health Association, Toronto Canada; 1986.

> Policies for reducing and re-organizing worktime are aimed at reducing inequalities and responding to the needs of individuals and groups, especially those traditionally underpriviliged. New approaches to worktime can allow us to improve the quality of life at work if introduced with drastic modifications to the organization of work patterns, greater individual and collective control over the work milieu and new technology, and more individual autonomy and creativity at work. The organization of worktime must also respond to the specific needs of women who now make up a significant part of the labour force and who seem to end up sharing unstable jobs most of the time. Women's specific expectations must be taken into account and a real sharing of housework between men and women as a daily reality must be ensured.

Simonsson, B.G. (1986). Allergies and Other Hypersensitivity Reactions to Indoor Pollutants: volume subtitled: Evaluations and Conclusions for Health Sciences and Technology. Indoor Air, Vol. 6, pp 57-59; 1986; Swedish Council for Building Research, Stockholm Sweden; Berglund, B.; Berglund, U.; Lindvall, T.; Sundell, J.; editors.

> In patients with asthma and hyperreactivity, small concentrations of a pollutant like sulphur dioxide can cause substantial and clinically

important respiratory effects. In acute severe episodes of air pollution, predominantly people with pre-existing heart and lung disease show an increase in mortality. Nitrogen dioxide and formaldehyde can also cause respiratory symptoms especially but not exclusively in hyperreactive subjects like patients with asthma. The compounds can possibly induce airways disease in combination with other pollutants in high concentrations and during exposure for a long time.

Simpson, Michael (1983). Indoor Air Quality and Health Impacts of Energy Conservation: Some Congressional Options. The Library of Congress, Congressional Research Service, Washington DC 20540; updated 09/08/83.

Keywords: indoor air quality; health hazards; energy conservation; research; public policy;

Sivak, Michael (1981). Human Factors and the Highway-Accident Causation: Some Theoretical Considerations. Accid. Anal. & Prev., Vol. 13, No. 2; pp. 61-64; 1981; Pergamon Press Ltd.

Skrzycki, Cindy (1987). Three of Five in U.S. Like Going To Work Survey Finds. Toronto Star, October 14, 1987.

A survey for The Conference Board found that three out of five Americans generally like their jobs and are interested in their work. A large majority said they are comfortable with their supervisors and their fellow workers. Only two out of five were reasonably satisfied with their pay cheques.

Small, Bruce M. (1982). Chemical Susceptibility and Urea-Formaldehyde Foam Insulation. National Research Council of Canada, Division of Building Research; February 1982.

Not everyone responds the same way when exposed to pollutants in the air. Initial observations of people exposed to formaldehyde and other gases emitted by Urea-formaldehyde Foam Insulation show a wide variation. But recent evidence indicates that there may be a larger group who are in general more susceptible to low levels of chemical exposures of various kinds. Preliminary reports indicate that some people who are exposed to UFFI gases, and who have no previous indication of chemical susceptibility, may become generally chemically susceptible as a result of the exposure. There is also evidence that for some people other allergic-like sensitivities may also have been triggered by the UFFI gas exposure, even in cases with no obvious history of allergy.

Small, Bruce M. (1982). Environmental Health Factors in Falling Accidents. National Research Council of Canada, Div. of Electrical Engineering, Medical Engineering Section, Ottawa Canada; October 1982.

This study surveys the literature and other sources of expertise to assess the possible role of environmental air pollutants in accidents involving falls in buildings. Evidence is presented which shows that certain pollutants can cause both gross and subtle perceptual and motor ability changes which clearly add to the risk of a falling accident occurring. In addition, it is shown that some people can be much more highly susceptible to common indoor air pollutants than others, and specific precautions to help such persons minimize risk of accidents are outlined. The study recommends that indoor air pollution should be recognized as both a health problem and a safety problem, and a number of followup investigations are suggested.

Small, Bruce M.; Lorimer, Judy; Russell, Peter (1983). Indoor Air Pollution and Housing Technology. Canada Mortgage and Housing Corp., Ottawa Canada; August 1983.

This reference contains a general review of the possible sources of indoor air pollution in residences, including a discussion of the literature describing the health effects of these contaminants. The report also reviews the principles of low-pollution design, with particular reference to an experimental building designed by the author. Available from Technology and Health Foundation, R.R.#1, Goodwood, Ontario L0C 1A0.

Small, Bruce M. (1984). Update on Indoor Air Quality Studies. American Academy of Environmental Medicine, 18th Advanced Seminar in Clinical Ecology Program, pp. 14-15; October 1984.

When populations with common risk factors under exposure to various pollutants are added up, greater than a quarter of the population is seen to be at risk, with the known chemically susceptible population representing only a small part of this group. Those at greatest risk from increased pollutant exposure include pregnant women and young infants, the elderly, other persons with existing respiratory and cardiac problems, the chemically susceptible portion of the allergic population, and smokers.

Small, Bruce M. (1985). Recommendations for Action on Pollution and Education in Toronto: A Report Prepared for the Pollution and Education Review Group of the Board of Education for the City of Toronto. Consultation Paper, May 1985, Board of Education for the City of Toronto, 155 College Street, Toronto, Ontario M5T 1P6.

The evidence presented in this report shows that staff and students are exposed to many pollutants which originate both within their schools and in the neighbouring communities. Many of these pollutants affect brain function, learning ability, behaviour, and hence education. They may also present a general health hazard. The sources of pollution range from industrial emissions and automobile exhaust outside, to painting, cleaning chemicals, art and science materials, tobacco smoke, and even chalk dust, inside. There is evidence that in some schools the ventilation may have been insufficient to adequately exhaust the pollutants being generated inside. Some students and staff are experiencing acute adverse effects from such exposures, while others do not appear to be suffering, at least in the short term, from the same exposures. Recent evidence indicates that this situation reflects the wide range of vulnerability to pollutants within our population. Some people suffer even at very low levels of contamination, well within previously accepted guidelines for tolerable levels of pollutants.

Small, Bruce M. (1985). Low-Pollution Building Design and Construction. Air Pollution Control Association.

Principles of low-pollution design are reviewed which may be applied in the Canadian climate either for minimizing pollutant levels in conventional housing or for producing specialized housing for persons who may be particularly prone to health problems in the presence of common indoor pollutants. Some of the primary techniques which have been useful in energy conservation are also either helpful or essential in low-pollution construction. For example, a tightly-sealed building envelope is indispensible if random leakage inward through walls brings pollutants from the exterior structure. Outward leakage of humid indoor air through building walls may produce condensation and mould growth, a possible indoor air hazard. It is also important to seal the building envelope below grade, to avoid drawing in soil gases which can include radon, water vapour, mildew odours, and other compoents.

Other principles highlighted are the provision of clean enough interior construction to allow fluctuations in ventilation and/or filtration without suffering badly deteriorated air during off-times for filtration or periods of repair or emergency. The provision of adequate storage combined with spot ventilation (for economical exhaust of pollutants) are essential features of design at least for chemically susceptible persons and would be of advantage in lowering general pollution levels in other applications.

Smith, Cathy (1985). Letter to the Prime Minister of Canada Concerning Budget Cuts in Environmental and Toxicological Programs, February 13, 1985. Canadian Association for Children and Adults with Learning Disabilities, Maison Kildare House, 323 Chapel, Suite 101, Ottawa, K1N 7Z2.

This letter emphasizes the need for further research on the effects of toxins on human health, productivity and human quality. The author states that there is new mounting scientific evidence showing that the human brain, especially in unborn and young children, is particularly vulnerable to toxic insult, and that such effects appear to be permanent.

Smith, Cyril W. (1987). Electromagnetic Man & His Electromagnetic Environment in Health and Disease. Unpublished presentation to the 5th Annual International Symposium on Man and His Environment in Health and Disease, February 26, 1987, Dallas, Texas, USA;.

> This researcher emphasized that a human system can act as an unstable amplifier in response to various stimuli, including a wide range of frequencies of electromagnetic energy. Clinical experiments with exposure of sensitive patients to weak electromagnetic fields indicated 'windows' of frequency response for both initiation and termination of physical symptoms. He emphasized the individual nature of this kind of sensitivity response.

Smith, Lendon (1979). Feed Your Kids Right. Dell Publishing Co., Inc.; 1079.

> Illness, hyperactivity, learning problems and stress can be prevented by diet and removal of environmental pollutants.

Smith, Lesbia F.; Victor, Janet (1987). Studies in Assessment of Risk and Management of Environmental Contamination. Occupational Health in Ontario, Vol. 8, No. 3, pp 90 - 101; Summer, 1987; Ontario Ministry of Labour, Occupational Health Branch, Toronto Canada.

> Presented in this paper are some of the issues that arise during the response to episodes of environmental contamination and response of the Ministry of Health to local agencies and the public's fear of passive exposure for environmental sources. The essential ingredients required to meet the expectations of scientists, government and community are: the designation of credible local authorities easily accessible to the public; maintaining a steady flow of information, even if it means admitting the temporary absence of data; obtaining expert advice on potential toxicity and having accepted experts available to the community; describing positive and scientifically sound plans to assess potential dangers to health; and keeping the media informed. Cases studies of the PCB spill in Kenora in 1985 and drinking water contamination from the Love Canal and in southwestern Ontario are presented in detail.

Solomon, R.L.; Natusch, D.F.S. (1977). Environmental Contamination by Lead and Other Heavy Metals. Vol. 3. Distribution and Characterization of Urban Dusts: Final Report. US Govt.; NTIS PB-287 153/1SL; July 1977.

> This volume describes studies of the sources and distribution of lead and cadmium in the dust and soils of an urban area. The work was conducted as part of a larger effort to identify the sources, distribution, and fate of lead and other heavy metals in both the rural and urban environments. Urban soils and settled dusts are of special interest from the standpoint of human health because it is with these potential carriers of

heavy metal pollutants that humans are most likely to come into contact. It is shown that current urban concentrations of heavy metals in dusts and soils, both indoors and outdoors, could have a significant impact on human health. A field survey of soils and settled dusts was conducted in the small urban area of Champaign-Urbana, Illinois. Objectives of the studies were: to determine where high levels of lead and cadmium are found in urban areas; to determine the sources of lead, cadmium, and polycyclic organic matter (POM); and to determine those physical and chemical properties of lead, cadmium, and POM which determine their environmental impact. Samples collected from several types of locations in an urban environment during the field survey were analyzed for their lead and cadmium content to determine the general distribution of these elements within the area and to identify local patterns of their concentrations in and around selected buildings.

Somers, E. (1987). Making Decisions From Numbers. Regulatory Toxicology and Pharmacology, No. 7, pp 35- 42; 1987.

Regulatory agencies require numbers to provide health protection. The manner in which these numbers are derived from animal experiments and human epidemiology is considered together with the limitations and inadequacies of these numbers. Some recent examples of risk assessment in Canada are given including asbestos, drinking water, and indoor air quality. The value of these numbers in providing a measure of the hazard in a wider perspective is stressed, although they can never be the sole determinant of public policy.

Soskolene, Colin L.; Coates, Randall A.; Sears, Abby G. (1986). Characteristics of a Male Homosexual/Bisexual Study Population in Toronto, Canada. Canadian Journal of Public Health, Vol 77, pp. 12-16; January/February 1986.

A 1983 survey provided baseline information on the male homosexual and bisexual population of Metropolitan Toronto. The median numbers of different male sexual partners over preceding time periods were about 50% lower than figures reported from United States centres. Population characteristics reported may be important when explaining observed differences in the frequency of AIDS around the world. The authors discuss the difficulty in establishing baseline information for good health research, in a population which is socially stigmatized, and, as a result, not enumerable.

Spasoff, Robert (1987). Special Study of Ontario's Health Care System. Government of Ontario.

The Spasoff Report, unavailable to this research team at the time of writing of the present review, is reported to have concluded that children in families living on welfare get sick because of poor nutrition and hostile living environments. Dr. Spasoff notes that historically, the poor live in the most dangerous areas.

Spedding, D.J.; Hamilton, R.B. (1982). Adsorption of Mercury Vapor by Indoor Surfaces. Environmental Research, Vol. 29, No. 1, pp. 30-41; 1982; Academic Press, Inc.

Keywords: indoor air pollution; metal pollution; mercury adsorption;

Speizer, Frank E.; Ferris, Benjamin, Jr.; Bishop, Yvonne M.M.; Spengler, John (1980). Respiratory Disease Rates and Pulmonary Function in Children Associated with N02 Exposure. American Review of Respiratory Disease, Vol. 121, No. 1; pp. 3-10; Jan. 1980.

As part of a long-range, prospective study of the health effects of air pollution, approximately 8,000 children from 6 years to 10 years of age from 6 communities had questionnaires completed by their parents and had simple spirometry performed in school. Comparisons were made between children living in homes with gas stoves and those living in homes with electric stoves. Children from households with gas stoves had a greater history of respiratory illness before age 2 and small but significantly lower levels of FEV, and FVC corrected for height. These findings were not explained by differences in social class or by parental smoking habits. Measurements taken in the homes for 24 hour periods showed that NO2 levels were 4 to 7 times higher in homes with gas stoves than in homes with electric stoves. However, these 24 hour measurements were generally well below the current federal (US) 24 hour outdoor standard of 100 ug/m 3. Short-term peak exposures, which were in excess of 1,100 ug/m 3, regularly occurred in kitchens. Further work will be required to determine the importance of these short-term peaks in explaining the effects noted.

Spencer, Christopher; Blades, Mark (1985). Children at Risk: Are We Underestimating Their General Environmental Competence Whilst Overestimating Their Performance?. Children Within Environments, Chapter 3, pp 39 - 49; Garling, Tommy and Valsiner, Jaan editors; Plenum Press; 1985.

Adult feelings of responsibility for the child are predicated upon beliefs that the child's competence is less than that of the able-bodied adult; the child is an apprentice in environmental skills. But parents often overestimate their children's performance in traffic. Recent realizations by environmental and developmental psychologists of the child's environmental skills is but one area of the current re-evaluation of a whole range of competencies in perceptual and cognitive domains that is going on in psychology. Ways are suggested in which adults can enhance children's performance in novel environments, with implications for road safety education and practice as it relates to children.

Spengler, John D.; Sexton, Ken (1983). Indoor Air Pollution: A Public Health Perspective. SCIENCE, Vol. 221, No. 4605, pp. 9-17; July 1 1983.

Although official efforts to control air pollution have traditionally focused on outdoor air, it is now apparent that elevated contaminant concentrations are common inside some private and public buildings. Concerns about potential public health problems due to indoor air pollution are based on evidence that urban residents typically spend more than 90 percent of their time indoors, concentrations of some contaminants are higher indoors than outdoors, and for some pollutants personal exposures are not characterized adequately by outdoor measurements. Among the more important indoor contaminants associated with health or irritation effects are passive tobacco smoke, radon decay products, carbon monoxide, nitrogen dioxide, formaldehyde, asbestos fibers, microorganisms, and aeroallergens. Efforts to assess health risks associated with indoor air pollution are limited by insufficient information about the number of people exposed, the pattern and severity of exposures, and the health consequences of exposures. An overall strategy should be developed to investigate indoor exposures, health effects, control options, and public policy alternatives.

Spitzer, Walter O. (1984). A Study of the Health Status of Residents of the Junction Triangle, Toronto: Final Report. Dept. of Public Health, City of Toronto; September 1984.

The purpose of the study was to determine whether the residents of the highly industrialized Toronto Junction Triangle experience adverse health effects more frequently than do residents of a demographically similar but minimally exposed (non-industrialized) area of the City of Toronto, and/or residents of areas adjacent to the Junction Triangle. A comprehensive questionnaire was administered to 110 children and 290 adults in each of: the Junction Triangle, the combined neighbourhoods adjacent to the Triangle, and the comparison tract. The author concludes that there is no difference in the health status of the adult residents of the Junction Triangle and those of the most comparable census tract of Toronto who were not exposed to the emanations from industry identified as being a problem in the Junction Triangle area. However, the study confirmed that the residents of the area experience markedly greater discomfort than people living in other areas of the city and the report recommends that industry guidelines should be established to "sharply reduce imposed factors that diminish the quality of life". It was also concluded that there is enough evidence of unfavourable health experience among children in the Junction Triangle area to warrant in depth, all-inclusive clinical evaluation of their health status.

Sprague, D.E.; Rea, W.J.; Smiley, R.E.; Johnson, A.R.; Lopez de Victoria, A.; Tucker, W.F.; Fenyves, E.J. (1982). Formaldehyde Sensitivity Following Exposure to Building Materials. presented at the 16th Advanced Seminar in Clinical Ecology, Banff, Canada.

Keywords: formaldehyde; building materials; sensitivity;

Squires, Bruce P. (1987). Medical Education To Achieve Health For All. CMAJ, Vol. 136, pp 474 - 475; March 1987.

The "Achieving Health For All" report lends even more credence to the growing concern among many medical educators that the undergraduate curricula of Canadian faculties of medicine do not provide educational programs that realistically reflect the health needs of the Canadian people. They present the concept that health is the absence of disease and that the goal of a medical education is to teach students to recognize and treat disease. Medical schools must devise undergraduate clinical programs that permit students to spend considerably more time in settings where they can acquire a more realistic view of the nature and extent of the major health problems that afflict people and develop the skills to cope with them. They must also allot considerably more time to the teaching of preventive medicine and health promotion and to imbuing their students with the recognition that physicians have a heavy direct and indirect responsibility in helping their patients and communities develop the behaviours that promote health.

St. Lawrence, Ivy (1986). The Twelfth Annual Report of The Ontario Advisory Council on Senior Citizens: For the twelve month period ending March 31, 1986. Advisory Council on Senior Citizens, Government of Ontario, Canada; 1986.

The Advisory Council on Senior Citizens promotes the view that seniors should be encouraged to accept responsibility for themselves to the fullest extent possible, including responsibility for a lifestyle affecting one's own health. However, health promotion strategies should be directed at the entire population, should begin well before retirement, and should be presented in a manner that is relevant to today's seniors. Health promotion should encompass the following: education demonstrating ways and means of illness prevention; nutrition; exercise and activities; wise use of medications and alcohol; and encouragement to become socially active as volunteers and participate in one's community. To a large extent, the current medical model in health promotion works against this objective. Physicians and other health professionals are trained to cure illness. This presents great problems for many of them in working with seniors, for whose illnesses cure is not always possible but who often require health management counselling.

Stebbings, James H., Jr.; Fogleman, Diane G. (1979). Identifying a Susceptible Subgroup: Effects of the Pittsburgh Air Pollution Episode Upon Schoolchildren. Am J Epidemiol, No. 110, No. 1; pp. 27-40; 1979.

Pulmonary function test results on 224 school children collected during and after the Pittsburgh air pollution episode of November 1975 were reanalyzed to determine whether a small subgroup of susceptible children could be defined. Individual regressions of three-quarter second forced expiratory volumes and forced vital capacities (FVC) on time over the six day study period were calculated, and the distributions of individual slopes for the four exposed and two control schools were compared. Excesses of strong upward trends in the exposed areas would suggest effects of suspended particulate air pollution by indicating significant improvement following the episode. A highly statistically significant excess of strong upward trends in the FVC among exposed students was observed, and was consistent by sex and by school within sex. Approx. 10 to 15% of the students appear susceptible to an average impairment of about 20% of the FVC. The findings are limited by the small number of subjects with strong post-episode upward trends in the FVC, and by lack of validation by replication of the study design, but do suggest that episode levels of suspended particulates induce lung damage, and that this may occur in a small susceptible subgroup. Children with low baseline pulmonary function values, histories of asthma, or with acute respiratory symptoms immediately following the episode were not found to be especially susceptible to these effects of suspended particulates.

Steensberg, Jens (1984). Indoor Climate Problems in Institutions for Children—Practical, Administrative and Policy Perspectives: Buildings, Ventilation and Thermal Climate; Berglund, Birgitta; Lindvall, Thomas; Sundell, Jan — editors. Indoor Air, Vol. 1, pp. 179-180; Swedish Council for Building Research, Stockholm Sweden, 1984.

On the basis of practical indoor climate problems in institutions for children, the study illustrates the administrative and policy perspectives of the decision making process, and some conclusions are attempted on possible ways of improving environmental health decision making. Examples of practical indoor climate problems in institutions for children are given. There are tentative answers to the following questions: How important are value attitudes versus scientific knowledge? Are existing regulations sufficient? How do local and central administrators handle indoor climate problems? Do the responsible politicians influence the course of events? What is the role of the press? Is the pressure from interest groups decisive?

Stephens, R. (1981). Human Exposure to Lead from Motor Vehicle Emissions. Intern. J. Environmental Studies, Vol. 17, pp.73-83; 1981; Gordon and Breach Science Publishers Inc.

A strictly quantitative assessment of the contribution made by car exhaust gas lead to the body lead burdens of young children will probably never be attained. However, there is now available a substantial scientific literature relating airborne lead to lead in humans, especially in young children who ingest deposited and impacted aerosol lead on both food and non-food items. It is clear from blood lead surveys that pre-school children absorb more lead than other sections of the community because young children have a relatively higher metabolic rate and ventilation at rest. The distributions of lead burdens reported for new-born and pre-school children have been set against levels of lead absorption recently associated with pregnancy problems in women and impaired cognitive/behavioural functioning in children. A study by Needleman et al. in Boston Massachusetts of 158 seven and a half year old children shows that high lead children (greater than 6 ppm) performed significantly less well on a range of I.Q. tests and behavioural ratings than low lead children.

Sterling, E.M.; Sterling, T.D.; Kobayashi, D. Hartel; McIntyre, E.D. (1983). Health and Comfort in Modern Office Buildings: Results of a Work Environment Survey. Theodor D. Sterling Limited, Vancouver B.C.; 1983.

A Work Environment Survey was undertaken to identify the causes of various health and comfort problems experienced by 1106 members of OPEIU Local 153 working in 12 office buildings. Problems were strongly associated with poor ventilation; poor lighting; fluctuations in temperature and humidity; inability to adjust and control ventilation, lighting, temperature, and humidity to individual office comfort needs; and use of video display terminals. Stress at work had a significant influence on health and comfort of employees. Not only were health related symptoms affected by physical factors, but they were also aggravated by inability to participate in the way time at work was allocated, by job insecurity and by poor relations with supervisors. In general there was a complex interaction between the states of environmental conditions and of stressors. Presence of smokers did not show any significant relationship to health and comfort complaints among either smokers or non smokers. But all indices of stress were heightened when smoking was restricted or prohibited.

The authors call for detailed architectural, epidemiological, and air quality studies that could provide regulatory agencies the evidence required to formulate standards which will ensure acceptable working conditions in modern office buildings, especially in structures specifically designed to conserve energy.

Sterling, Elia; Sterling, Theodore; McIntyre, David (1983). New Health Hazards in Sealed Buildings. AIA Journal, pp. 64-67; April 1983; American Institute of Architecture.

Keywords: indoor air pollution; health hazards; housing design;

Sterling, T.D.; Sterling, E.; Dimich-Ward, H. (1983). Building Illness in the White-collar Workplace. Int. J. Health Serv., Vol. 13, No. 2, pp. 277-287; 1983.

The authors describe an increasing incidence of "building illness" among white-collar workers due to the high pollutant content of air in modern energy-efficient office buildings. These buildings are hermetically sealed, mechanically ventilated, and contain many materials that give off a variety of toxic fumes and aerosols. Severe outbreaks of illness have also been traced to ventilation problems in sealed hospital buildings.

Sterling, Theodore D.; Collett, Chris W.; Sterling, Elia M. (1987). Environmental Tobacco Smoke and Indoor Air Quality in Modern Office Work Environments. Journal of Occupational Medicine, Vol 29, No. 1; pp 57 - 62; January 87.

Recent attempts to clean the air in modern sealed office buildings appear to have focused on one component of indoor air quality, environmental tobacco smoke. Prohibiting smoking entirely or designating specific smoking areas has been suggested to improve comfort of office workers and reduce acute symptoms of building illness. The effectiveness of such methods, as well as the overall relations of tobacco smoke to indoor air quality is evaluated, based on reviews of a large number of studies of indoor air quality in modern office buildings under normal use and occupancy. Tobacco smoke does not appear to contribute significantly in a build-up of contaminants in offices. Also, in two large series of studies of buildings with health and comfort complaints in the US and Canada, tobacco smoke does not appear to be associated with cases of building illness.

Designation of special smoking areas might remove multiple sources of irritation to smokers and non-smokers alike. One the other hand, the segregation of smokers to specially designated and smoking areas may have little effect and may well have undesirable impacts on ventilation performance. Concentrating smokers in designated smoking areas may place an excessive local burden on existing ventilation systems with the result that smoking office workers are exposed to high levels of irritants for short-time periods with any benefits accruing to their non-smoking coworkers. To be of any real use, specially designated smoking areas may require installation and operation of higher volume ventilation systems with more effective air cleaning devices and possible direct venting outside.

Stewart, Donald W.; Toews, John A. (1982). The Chronic Mental Patient: A Selective Annotated Bibliography of the Psychiatric Literature, 1970-1980. Canadian Mental Health Association; August 1982.

This work constitutes part of a national study undertaken to assess the situation of the chronically mentally ill in Canada. It is a selective annotated bibliography of over 400 references from the professional literature on the service system for people with chronic mental disorders.

Stewart, Richard D. (1976). Paint-remover Hazard. Journal of the American Medical Association, Vol. 235, No. 4, pp. 398- 401; January 26, 1976.

Keywords: paint remover; indoor air pollution; health hazards;

Stewart, Richard D.; Hake, Carl L. (1976). Paint-Remover Hazard. JAMA, Vol. 235, No. 4, Jan. 26, 1976.

> The in-home use of paint removers containing methylene chloride results in the absorption of this solvent, which is metabolized to carbon monoxide. Exposure for two to three hours can result in the elevation of carboxyhemoglobin (COHb) to levels that stress the cardiovascular system. The metabolic formation of COHb continues following the paint-remover exposure, doubling the duration of the cardiovascular stress produced by a comparable COHb level after exposure to CO. Patients with diseased cardiovascular systems may not be able to tolerate this unexpected stress.

Stokes, P.M.; Forester A.; Hale, L; Hutchinson, T.C.; and Lee, B. (1985). The Cutler Acid Plant Study: A Multidisciplinary Approach to Rehabilitation. Trace Substances in Environmental Health - XV: A Symposium; pp. 340-349; 1981.

> The abandoned 100-acre site of operation of a multi-million dollar sulphuric acid factory, on part of the Serpent River Indian Reserve, is still devoid of vegetation over large areas, with a total vlume of 60,000 cubic yards of foreign material, mainly in the form of waste piles of pyrite sulphur and calcine and old sulphur storage areas. The surface waters have pH as low as 2.5, with elevated levels of heavy metals, and drain into Aird Bay on Lake Huron. This study identified five rehabilitation options, with associated costs and types of land use for each. The Cutler site if one of several pollution concerns on the Reserve. The Serpent River itself is contaminated with radioactive material from Elliot Lake, and the Aird Bay fishery has been tainted by pulp and paper mill effluent fom Espanola.

Stokinger, H.E.; Scheel, L.D. (1973). Hypersusceptibility and Genetic Problems in Occupational Medicine—A Consensus Report. Journal of Occupational Medicine, Vol. 15, No. 7, pp. 564-573, 858, 860; July 1973.

> Keywords: hypersusceptibility; occupational medicine;

Stotsky, Karen (1987). Occupational Health and Safety. Integration and Participation, chapter 6, pp 85 - 101; Canadian Advisory Council on the Status of Women; 1987.

> As a result of their segregation into a few occupational categories, large numbers of women in the paid workforce are exposed to particular types of health and safety hazards. These include clerical workers who are exposed to VDT radiation hazards, poor lighting, excessive noise, toxic substances, and poor ventilation as well as poorly designed furniture and monotonous jobs. Retail and service workers face hazards associated with bending, lifting and carrying. Hairdressers working

around tonics, dyes, pungent chemicals, and aerosol sprays on a daily basis are susceptible to respiratory problems and skin conditions. Teachers and child care workers are exposed to a variety of communicable diseases, as are nurses. Health care workers are also exposed to radiation, anaesthetic gases, and other toxic substances. Regardless of their place of work, stress is a common problem for most women workers. Factors causing stress include heavy workload, low pay, little job control, lack of recognition, monotonous work, unrealistic deadlines, and the added burden of home responsibilities. A useful bibliography is included.

Stratton, Peter (1985). The Role of the Family in Childhood Risk: The Origins of Competence. Children Within Environments, Chapter 9, pp 129 - 144; Garling, Tommy and Valsiner, Jaan editors; Plenum Press; 1985.

Children and other groups such as the aged may be put at risk because of egocentric thinking by those with more power to structure their environments. An evaluation of the dangerousness of particular environments requires a sophisticated understanding of how the environmental characteristics relate to those concerned. A failure to recognize the different perceptual capabilities, decision processes, motivations, etc. of a particular group can lead to the provision of environments which present no great risks to a healthy adult, but which can be extremely hazardous to others such as children. The prospects of reducing risks to children then depend largely on achieving a full and detailed appreciation of how their characteristics relate to those of the contexts in which they must function, and on transmitting this information to those who care for them.

Strickland, Bonnie R. (1982). Implications of Food and Chemical Susceptibilities for Clinical Psychology. International Journal of Biosocial Research, Vol.3, No. 1, pp. 39-43; 1982.

Many problems result when the clinician attempts to understand the role of food and chemical substances in behavior problems. The enormous range of individual differences, public misconceptions, lack of research, and the problem of applying old approaches to new situations, all affect how the clinician relates to patients. The public and professionals must become educated as to primary prevention. Clinicians must broaden their repertoire of assessment and treatment techniques.

Subcommittee on Formaldehyde and Air Contamination in Public Buildings (1983). Report of the Subcommittee on Formaldehyde and Air Contamination in Public Buildings. Inter-Ministry Committee of Safety and Occupational Health, British Columbia BC; July, 1983.

Health problems have been linked to poor air quality in a few public buildings in the province, including schools. Twenty school districts have had reports of alleged symptomatic health effects among students, particularly in portable classrooms. Most of those districts have carried out air testing for formaldehyde and implemented remedial measures. Research is needed into a variety of aspects of the indoor air pollutant problem, including the relationship between short-term exposure to high concentrations and long periods of low level exposure; the effects of humidity on the emission of formaldehyde; and the production and evaluation of controls and standards for mechanical ventilation and air-cleaning systems.

Suedfeld, Peter (1983). Stressful Levels of Environmental Stimulation: Misplaced Emphasis. Stress and Anxiety, Chapter 6, pp 109 - 127; Sarason, Irwin G.; Spielberger, Charles D. ed; Hemisphere Publishing Corporation; 1983.

> There are stressful levels of environmental stimulation or environmental load. Social isolation and restricted environmental stimulation can conversely lead to stimulus underload. Comprehensive bibliography is included.

Suess, Michael J. (1984). Exposure and Health Effects of Indoor Air Pollution. Clinical Ecology, Vol 11, No. 3, pp. 130-136; Summer 1984.

> Increased concern about indoor air pollution has led to increased effort to determine its sources and how to prevent it. Indoor pollutants may be generated outdoors as well as indoors through a variety of mechanisms. Vehicles and transportation terminals present special problems as do public buildings and medical facilities. More indoor pollution data is needed before adequate assessments of indoor pollution can be made.

Sugita, Kido; Ogihara, Arata; Murabayashi, Hiroshi; Ichikawa, Sehchi; Shishido, Masao (1981). The Relationship of Air Pollution and Respiratory Function and Bacterioflora in Pharyngeal Mucus on Junior High School Students. Yokohama Med. Bull., Vol. 32, No. 3-6, pp. 215-225; 1981.

> The studies were performed to investigate the effect of multiple air pollutants on the human body. Examination of respiratory function were made by means of the flow-volume curve method and the bacterioflora in pharyngeal mucus were examined. Students from three junior high schools located in a polluted area, a less-polluted area, and a non-polluted area, were tested and the results were compared. The results obtained were as follows: comparing maximal expiratory flow rate in summer, fall and winter, it was highest in summer; measures of central airway respiratory function were the lowest at the school in the most polluted area; streptococci occurence was high in winter and gram negative bacilli occurrence was high in summer; gram negative bacilli were the lowest at the school in the non-polluted area.

Sullivan, John L. (undated). Office Air Contaminants and Their Sources. University of Western Ontario, Occupational Health & Safety Resource Centre.

> Several studies of buildings have been conducted as a result of complaints about air quality. The increased importance of building ventilation due to recent sealing of buildings for energy conservation is highlighted. Typical sources of indoor air pollutants are described. These include sulfur oxides, ozone, pollens, lead, chlorine, nitrogen dioxide, carbon monoxide and dioxide, particles, radon, formaldehyde, asbestos, synthetic fibres, polycyclic hydrocarbons, ammonia, mercury, aerosols and allergens.

Sutton, Robert (1987). Tenant's Inquest Told of Problems Faced by Disabled. Toronto Star, 1987.

> The inquest into the death of a disabled woman was told that there were many things wrong with the Ontario Housing Corp highrise where she had lived. The legless widow died as a result of infection from injuries due to falls. Only two of four main entrances were usable by those in wheelchairs, while one ramp was dangerously steep, too narrow, and lacked handrails, according to a study of the building. There were many more access-oriented problems in the building which was originally not designed with the disabled in mind.

Symonds, Alexandra (1986). The Dynamics of Depression in Functioning Women — Sexism in the Family. Journal of the American Academy of Psychoanalysis, 14(3); pp 395 - 406; 1986; John Wiley & Sons, Inc.

> The incidence of depression in women is at least two times as high as in men, yet there is very little discussion in the psychoanalytic or psychiatric literature which addreses itself to this gender difference in any meaningful way. There is a group of functioning women who are doing fairly well at home and at work, but who have a chronic, underlying depression which has lasted for years. Outward manifestation of this is persistently low self-esteem and a deep sense of insecurity, regardless of external facts to the contrary. Many of this doctor's patients had in common a background which included a brother who was favoured because he was a boy. While this is not the only cause of the increased incidence of depression in women, it intensifies the entire dynamics with which most girls must cope while growing up in a culture of prejudice. Rejection because of gender, being demeaned, trained to serve others, and to repress their own needs create the emotional climate which leads to low self-esteem, insecurity, and depression. The produces lifelong effects in many women which can seriously hinder growth.

Szymusiak, Susan M.; Ryan, Joseph P. (1982). Prevention of Slip and Fall Injuries: Professional Safety. Professional Safety, pp. 11-15; June 1982.

> Keywords: falling accidents; accident prevention;

Tager, Ira B.; Weiss, Scott T.; Rosner, Bernard; Speizer, Frank E. (1979). Effect of Parental Cigarette Smoking on the Pulmonary Function of Children. American Journal of Epidemiology, Vol. 110, No. 1, pp. 15-26; 1979; Johns Hopkins University School of Hygiene and Public Health.

> The authors have investigated the effects of parental smoking patterns on the pulmonary function of children in East Boston, Massachusetts. A crude inverse dose-response relationship was observed between the level of forced expiratory flow 25-75 per cent of forced vital capacity per cent predicted (FEF 25-75 %) of children who never smoked and the number of smoking parents in the household. Compared to children with two non-smoking parents, the level of FEF 25-75 % predicted was 0.156 and 0.355 standard deviation units lower for children with one and two currently smoking parents, respectively. An additional decline in level of FEF 25-75 % predicted was observed for children who themselves had smoked. Smoking children with two smoking parents had an average FEF 25-75 % predicted level which was 0.355 standard deviation units lower than non-smoking children with two smoking parents. These data not only confirm that cigarette smoking by young children and teenagers has direct measurable effects on their pulmonary function, but also show that cigarette smoking by parents has a measurable effect on the pulmonary function of their children which is independent of any direct use of cigarettes by the children.

Tall, F.D. (1987). Air Quality Complaints in University Academic Buildings. Personal Interview with Prof. Franklin D. Tall, University of Toronto, December 9, 1987.

> Franklin D. Tall is Professor of Mathematics and Chair of the Health and Safety Committee for the Main Academic Building for the Faculty of Arts and Science at the University of Toronto. He notes that classrooms and academic offices are more suitable for chemically susceptible individuals when fresh air is introduced directly into the room, rather than through a central recirculation system which mixes fresh air with large volumes of polluted air. He finds that organizations are extremely slow to respond to air quality complaints, and that provincial inspectors don't know how to deal with indoor air quality problems in non-industrial situations.

Task Force on the Child as Citizen (1978). Admittance Restricted: The Child as Citizen in Canada. Canadian Council on Children and Youth; 1978.

> This report discusses the needs of children in relations to Canadian law and social practice and argues for the recognition of children as persons in their own right. Decisions made for and on behalf of children must recognize the individuality of each child's interest and the need for equality of opportunity within the context of the family and the broader society. The existence of true citizenship status for the young will be determined by the degree to which governments and institutions

are mindful of the needs of the young as they pursue their mandates. When the systems lose sight of the purpose for which they were created and the needs of all the citizens they were designed to serve, then it is the weakest members of society who suffer the gravest consequences.

If we are to judge from recent trends, children are, on the one hand, viewed as exotic pets and on the other, as adults in miniature, a consumer market to be ruthlessly exploited. Children are essentially the property of their parents who are free to do with them virtually what they will. The circumstances of children are usually determined by those of their families. Children who are left solely dependent on the economic circumstances of their families have nothing approaching equal access to the full range of goods and amenities society has to offer. Under present circumstances, a health system dominated by an individualized curative approach is unlikely to use its highly specialized personnel to reach out to families to begin active disease prevention and health promotion.

Taylor, Ralph B.; Brower, Sidney (1985). Home and Near-Home Territories. Home Environments, Human Behavior and Environment; Vol. 8; pp. 183 - 212; Plenum Press; New York; 1985; Altman, Irwin and Werner, Carol M., editors.

This is a discussion of the exterior spaces adjoining the home: porches, steps, front yards, back yards, driveways, sidewalks, and alleys. They are important for two reasons: what happens there strongly influences the quality of life in the home; and they represent spaces where the private and personal interpenetrate with the public and shared. The control exercised over these outdoor locations, the responsibility for management of activities, and upkeep, contribute to the immediate society by helping to define and stabilize the standing pattern of behavior on the street block. Different socio-economic groups deal with assaults on this territory in different ways. For instance, residents on a high-crime, low-income street have little material or political means to use as a leverage against possible threats and co-resident distrust is likely, thereby precluding effective group social action against a threat. When people experience less control over this territory than is desired, the discrepancy is viewed as stressful.

Thatcher, R.W.; Lester, M.L.; McAlaster, R.; Horst, R. (1982). Effects of Low Levels of Cadmium and Lead on Cognitive Functioning in Children. Archives of Environmental Health, Vol. 37, No. 3, pp. 159-166; May/June 1982.

Hair cadmium and lead content were related to intelligence tests, motor impairment assessments, and school achievement scores from 149 children aged 5 to 16 enrolled in rural Maryland public school systems. Hair cadmium and lead were significantly correlated with both intelligence scores and school achievement scores, but not motor impairment scores. Significant relations with IQ were obtained after regressing out demographic factors and were observed, even in children within a normal

IQ range. Evidence of different effects of cadmium and lead on cognitive development was obtained. Hierarchical regression analyses suggest that cadmium has a significantly stronger effect on verbal IQ than does lead and that lead has a stronger effect on performance IQ than does cadmium.

Thatcher, R.W.; Lester, M.L. (1985). Nutrition, Environment Toxins and Computerized EEG: A Mini-Max Approach to Learning Disabilities. Journal of Learning Disabilities; Vol. 18, No. 5, pp. 287 - 297; May, 1985.

A computerized EEG process called neurometrics has been used to help identify environmental and nutritional factors that may have either a negative or positive effect on child development. A two-pronged strategy involves investigation of environmental factors, the maximization or minimization of which are potentially within the control of parent, child, and educational or health care professional working with a family. The environmental factors which may be of importance for an individual child are determined. Evidence of environmental toxin contribution is routinely assessed when children with learning and behavioural problems are evaluated. If assessment is positive, efforts can be taken to reduce or eliminate the toxins from the body, to minimize contact with the environmental sources of the toxins, and to strengthen overall health by means of a good diet.

Thielebeule, U.; Pelech, L.; Grosser, P-J.; Horn, K. (1980). Height and Bone Age of School Children in Areas of Different Concentrations of Air Pollution: A Repeat Study Conducted in Bitterfeld and Berlin, East Germany. Zeitschrift Fuer Die Gesamte Hygiene Und Ihre Grenzgebiete; Vol. 26, No. 10; pp. 771-774; 1980.

An examination of the height and bone age of school children living in areas of different concentrations of air pollution in comparison with their calendar age was repeated ten years later. There was a substantial drop in dust emission in the highly polluted area of Bitterfeld in the period between the first and repeat examination thanks to considerable investments in the field of energy economy. This was accompanied by a more favourable development of the height and bone age of children living in Bitterfeld than in the preceding period and they are now closer to those of children living in Berlin. It is assumed that these improvements are connected with improvements in the environmental conditions.

Tobin, Richard S. (1986). Health Effects of Airborne Bacteria. Health and Welfare Canada Working Group on Fungi and Indoor Air; March, 1986.

Some adverse human health effects related to bacteria in air are documented. It covers person-to-person transmission of bacterial disease by the air route and problems caused by the excessive concentrations of various types of bacteria in indoor air, particularly after amplification by devices such as humidifiers. It does not include endotoxins nor

Legionella. The most serious consequences on human health are usually observed in especially susceptible populations, but allergic responses ranging from trivial to life-threatening can result in the general population. There is currently little information relating to the presence or absense of airborne bacteria from thermal insulation materials.

Tobin, Richard S.; Baranowski, Eugene; Gilman, Andrew P.; Kuiper-Goodman, Tine; Miller, J. David; Giddings, Michele (1987). Significance of Fungi in Indoor Air: Report of a Working Group. Canadian Journal of Public Health, Vol. 78, Number 2; Canadian Public Health Association; 1987.

Insulation and sealing of homes has reduced the exchange of air between indoors and outdoors and has led in many homes to an accumulation of previously vented pollutants. This report is in response to a request from Consumer and Corporate Affairs Canada for an assessment on the extent to which microorganisms could be a cause of illness in homes.

It was concluded that fungi are common contaminants of indoor air and dust, causing illness such as respiratory and skin allergies, infection of tissues, as well as systemic toxicity. Symptoms from documented exposures have ranged from very minor to severe, including death. Conditions in the home are crucial determinants of the airflora. Fungi thrive in moist conditions, the presence of suitable substrate, and moderate temperatures. Little is known about the types of effects of mycotoxins and fungal volatiles in indoor air. There is a wide range of sensitivities among humans. Recommendations included that research efforts on indoor air quality should consider fungi as an integral and important parameter to study; effort should be made in design, construction, modification, and maintenance of buildings to ensure that exposure to indoor microflora is kept as low as possible; assessment of the health effects of fungi and their components should include data obtained from immuno-toxicity assays and studies conducted in inhalation chambers; efforts should be directing improving human allergy testing; and testing and approval of materials for homes should consider the potential to lead to biological problems. An extensive bibliography is included.

Todd, Dave (1987). Central America Still Uses Banned Pesticides. Toronto Star, July 8, 1987.

Canadian consumers may not be able to fully protect themselves from harmful chemical substances in their food supply, even though the chemicals may be banned in this country. Central America has become a lethal dumping yard for pesticides that North American and European chemical companies are banned from selling or producing. Many foods which are imported to Canada from Central America contain residues of chemicals which are proven to cause cancer and/or central nervous system damage such as DDT, paraquat, Phosvel, DBCP and others.

Toews, J.; Barnes, Gordon (1982). Chronic Mental Disorders in Canada: A Needs Assessment Project prepared for the Canadian Mental Health Association. Health and Welfare Canada; December 1982.

> Mental institutions have, in the past few years, been downgraded as the cornerstone of the mental health care system in favour of community and general hospital treatment. However, increasing concern has been raised about the fate of the de-institutionalized patient in the community, including reports of inadequate housing, life skills, activity and work preparation programs, as well as staff overload and frustration at lack of resources. There is a stigma which operates at both the societal level promoting ghettoization, and at the professional level. At the service level, the attitude is often paternalistic. This project included a needs assessment survey of 222 mental health professionals, provincial forums, a national forum, and a selective annotated bibliography. Many recommendations were made concerning the specific aspects of services. These include an intensified advocacy stance on the part of the Canadian Mental Health Association which would include public education, governmental lobbying, and volunteer programs. Studies were suggested into mental health needs in northern and remote areas and the perspectives of clients, friends and relatives.

Toronto Star (1985). '20th Century Disease' Kids Get Separate Special Class. Toronto Star, March 27, 1985.

> This newspaper article describes action taken by principal Harry McCosh of Kitchener Collegiate Institute in Kitchener, Ontario, to provide a special low-pollution classroom in this secondary school, for use by students who are hypersensitive to low levels of indoor air pollutants.

Toronto Star (1987). Japan Mistreats its Kids Who've Lived Abroad, Critics Say. Toronto Star, April 18, 1987.

> Japanese children who have lived abroad are reported to be treated like aliens when they return home, an experience which can be very stressful. Education Ministry studies indicate that more than 80% of children who have lived abroad experience problems when they return. Parents blame Japan's rigid education system. Educators blame deterioration in the children's ability to speak Japanese. Others feel that differing perceptions of childhood are to blame, and that strong pressure on Japanese children eventually causes frustration and aggression.

Toronto Star (1987). Countdown Acid Rain: Summary and Analysis of the Second Progress Reports by Ontario's Four Major Sources of Sulphur Dioxide. Ontario Ministry of the Environment; February, 1987.

> Under Ontario's Countdown Acid Rain program, the four major sulphur dioxide sources are submitting technical progress reports every six

months. Each of the companies has complied with the legal requirements and technical progress continues to be made across a broad front. Detailed financial information is not available for most of the needed technical changes, in view of the fact that much of the developmental work has not been completed.

Toronto Star (1987). Acid Rain Threatens Half-Billion People, UN Study Says. Toronto Star, July 7, 1987.

Acid rain is now a health threat to more than half a billion people, according to a new United Nations report. The report, prepared jointly by the UN Environment Program and the World Health Organization, says that the pollution is endangering some 600 million city-dwellers worldwide. Another billion people are exposed to high pollution levels that result from coal, wood, oil combustion and automobile traffic dust.

Toronto Star (1987). Doctor Urges Basements Be Tested For Radon Gas Linked To Lung Cancer. Toronto Star, September 17, 1987.

Homeowners should be testing for radon that may be sneaking through the cracks and crevices of their basements, says Dr. Michael Moss, a medical professor at Dalhousie University in Halifax. Moss says that radon gas, produced naturally in many parts of the country from uranium in the ground, causes at least 400 lung cancer deaths a year in Canada.

Toronto Star (1987). Ottawa Bans Smoking on Short-Haul Flights: Passengers Who Won't Butt Out Could Face Fines of $5,000 Under New Rules. Toronto Star, September 16, 1987.

Smoking will be banned on most Canadian airline flights within North America under new federal legislation to take effect on December 9. Fines for smoking will be $5,000 and airlines will be fined $25,000 for allowing smoking. Representatives of Canada's two largest airlines say smoke-free air travel has been increasingly popular among passengers.

Toronto Star (1987). Modern Offices Hazard to Health, Civil Servants Say. Toronto Star, July 1, 1987.

Modern office buildings are full of materials, equipment, and furniture that are hazardous to workers' health, according to a statement by the Economists', Sociologists' and Statisticians' Association, a union which represents 2,400 federal public servants. The impact is compounded by the trend toward sealed buildings with internal ventilation systems.

Toronto Star (1987). Poor Kids Shorter or Fatter, Study Says. Toronto Star, June 25, 1987.

A surprising number of children under 5 from low-income families are shorter or fatter than most other youngsters, which could be blamed on chronic under-nutrition, according to U.S. health researchers from the National Centers for Disease Control.

Toronto Star (1987). 24% Feel They're Victims of Discrimination: Gallup. Toronto Star, November 26, 1987.

This popular press report, released just prior to the final draft of the present study, indicates that about one in four Canadians feel they have been discriminated against in one way or another. The figure of 24 per cent, obtained in a recent Gallup poll, is an increase from 19 per cent in a similar poll in 1981. Gallup attributed the increase to a broader awareness of human rights and to legislation resulting from the Charter of Rights and Freedoms. The equality of rights section of the Charter bans any discrimination on the grounds of race, national or ethnic origin, sex, age, or mental or physical disability.

Tosteson, Tor D.; Spengler, John D.; Weker, Robert A. (1982). Aluminum, Iron, and Lead Concentrations of Personal, Indoor, and Outdoor Respirable Particles: from Indoor Air Pollution; Spengler, John—editor; pp. 265-268. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

Samples of respirable particulate matter collécted during a personal monitoring study in Topeka, KA, were analyzed for iron, aluminum and lead content. The sampling protocol and instrumentation and described in detail. Lead indoor concentrations (median = 79ng/m 3) were found to be less than both personal (median = 112ng/m 3) and outdoor lead concentrations (median = 106ng/m 3). The indoor, outdoor, and personal levels of iron and aluminum were not significantly different. In addition, it was determined that outdoor respirable particulate mass does not correlate well with the personal or indoor metal concentrations, and that the amount of time spent in motor vehicles is a relatively good indicator of lead exposures. The relationships between indoor, outdoor, and personal lead are discussed in greater detail, with references to supporting evidence from other studies.

Townson, Monica (1986). A New Work Agenda For Women: A New Work Agenda for Canada. Canadian Mental Health Association, Toronto Canada; 1986.

Over the past 15 years, there have been remarkable changes in the economic role of women. The impact on family life is likely to be profound. But policy-makers have been slow to recognize the nature and extent of the changes that have taken place. Policies and programs based on an outdated perception of "the family" and of the relationship between family life and work may be hampering a smooth transition to a new social structure. Unless a different approach is adopted, there could be long-lasting negative consequences for families, children, and society in general. A new framework is needed within which policies can be developed to address the new reality of family life and work. A new work agenda for women must focus on the particular interests and concerns of women. New patterns of worktime arrangements must make sure that women have access to a fair share of meaningful, dignifying paid work. We must value alternative forms of work such as family responsibilities and voluntarism but also recognize that for too long women have been engaged in these activities without recognition or pay in addition to their paid employment.

Trainor, John; Church, Kathryn (1984). A Framework for Support for People With Severe Mental Disabilities. Canadian Mental Health Association, Toronto Canada; December 1984.

In our collective relationship to people with severe mental disabilities we find ourselves balanced between institutional care, a familiar strategy which we know to be debilitating in the long term, and community integration, a relatively new approach which has been unsuccessful to date because of a lack of full commitment to its promise. The following questions need to be asked: How do people with severe mental disabilities in your community receive the support they need? Do you view the provision of support to people with severe mental disabilities as solely the responsibility of trained professionals? What creative ideas do you have for building new forms of support when existing forms are inappropriate?

Traynor, G.W.; Apte, M.G.; Girman, J.R.; Hollowell, C.D. (1981). Indoor Air Pollution from Domestic Combustion Appliances. US Govt.; June 1981.

Keywords: gas appliances; carbon monoxide; formaldehyde; indoor air pollution; nitrogen dioxide; energy conservation; kerosene; homes; space heaters; stoves; ventilation;

Traynor, G.W.; Apte, M.G.; Dillworth, J.F.; Hollowell, C.D.; Sterling, E.M. (1982). The Effects of Ventilation on Residential Air Pollution Due To Emissions from a Gas-Fired Stove: from Indoor Air Pollution; Spengler, John—editor; pp. 447-452. Environment International, Vol. 8, No. 1/6; 1982; Pergamon Press, Oxford, Toronto; 1982.

The use of indoor combustion appliances can cause an increase in the levels of many different pollutants. The work presented here shows the usefulness of a model for extrapolating environmental chamber results on pollutant emissions from combustion appliances to determine indoor pollutant concentrations in actual residences. In addition, the effects of infiltration, whole-house ventilation, and spot ventilation on pollutant levels are investigated. The results show that a range hood is the most effective means of removing pollutants from a gas-fired range; removal rates varied from 60% to 87%.

Turiel, I.; Hollowell, C.D.; Miksch, R.R.; Rudy, J.V.; Young, R.A.; Coye, M.J. (1983). The Effects of Reduced Ventilation on Indoor Air Quality in an Office Building. Atmospheric Environment, Vol. 17, No. 1, pp. 51-64; 1983.

Keywords: human microorganism; office buildings; ventilation; humidity;

Turiel, Isaac (1985). Indoor Air Quality and Human Health. Stanford University Press, Stanford CA; 1985.

Air pollution inside buildings may be very much worse than it is outside, according to a recent government report. But efforts to control air pollution have traditionally focused on outdoor air, despite the evidence that urban residents typically spend about 90 percent of their time indoors. This is a readable summary of what is known about the several threats to be found in indoor air, whether in private homes, office buildings, or public places. It assesses various health risks associated with indoor air pollution, and suggests what can be done to lessen the effects of the major contaminants — combustion products from cooking, heating, and cigarette smoke; chemical evaporants from household products and building materials; microbes and allergens; and radon. Two special problems are also discussed: the unhealthy side effects of promoting energy-efficient houses and airtight office buildings, and the complicated regulatory and legal sanctions that impinge on the quality of indoor air. Appendices list relevant U.S. government agencies and describe commercially available air-purification devices. An extensive bibliography is included.

Turner, G; Jackins, H.; (1981). An Interview with Gill Turner on Young People's Liberation. Young and Powerful, No. 2; 1981; Rational Island Publishers, Box 2081 Main Office Station, Seattle, Washington 98111, USA.

The author, 17 years of age at the time of the interview, stresses the importance of young people maintaining pride in themselves, and not colluding with many false ideas about youth that are pushed at them by older people. She describes feelings that many young people get, of being superfluous, of not fitting in, and that it doesn't matter what they do. She notes that more obvious forms of oppression of young people, such as physical violence and battering, are still common, but not as universal as they once were. Less obvious, but still critical forms of oppression of young people by adults include: not expecting the best from young people; expecting less than full humanness from them; ignoring their potential; and treating them as less than human. Such attitudes erode a young person's sense of importance, of confidence, and of power.

She adds: "The most terrible thing about oppression (of young people) is not being treated with respect, not being viewed as important, not having real information. This usually results eventually in the young person giving up and allowing her/himself to just drag along with the patterned world." She emphasizes that because young people are themselves made to feel powerless, while young, they are more inclined to go along with oppression of any other people when they are older. It is part of social conditioning that the society puts upon every person as they grow up, to accept being oppressed and to co-operate in the oppression of others.

Twigge-Molecey, C. (1987). The Impact Assessment Study. Occupational Health in Ontario, Vol. 8, No. 2, pp 53 - 68, Spring, 1987; Ontario Ministry of Labour, Occupational Health Branch, Toronto Canada.

Implementation of the proposed right-to-know laws will put tremendous pressure on companies. While the objectives of the legislation are highly desirable, the implementation period will be difficult, costly, and likely fraught with confusion.

US National Research Council (1969). Effects of Chronic Exposure to Low Levels of Carbon Monoxide on Human Health, Behavior and Performance: Final Report. US Govt.; 1969.

This is an assessment of the state of knowledge concerning the effects on human health of carbon monoxide, one of the major atmospheric pollutants. Presented are well established observations on effects of low levels of C0 encountered on urban streets and in traffic tunnels. Research is recommended to broaden present knowledge of physiology and biochemistry of CO toxicity.

US Radiation Policy Council (1980). Report of the Task Force on Radon in Structures. US Govt.; NTIS PB81-166258; August 15, 1980.

Keywords: radon; natural radioactivity; buildings; health risks; NHW

Ulsamer, A.G.; Gupta, K.C.; Cohn, M.S.; Preuss, P.W. (1982). Formaldehyde in Indoor Air: Toxicity and Risk. Air Pollution Control Association; June 1982.

The Consumer Product Safety Commission has received over 3,000 complaints involving consumer exposure to formaldehyde vapor released from building materials. Indoor levels of formaldehyde may range from less than 0.01 to approximately 3 ppm. The effects of formaldehyde on human health derive in part from its properties as a strong irritant and sensitizer. Exposure to formaldehyde can produce a variety of symptoms depending on the mode, duration, and concentration of exposure. They range from statistically significant irritant responses of the eye, nose and throat to prolonged eye, nose and throat irritation, coughing, wheezing, diarrhea, nausea, vomiting, headaches, dizziness, lethargy, irritability, disturbed sleep, olfactory fatigue, and skin irritation. It has been demonstrated to be mutagenic in bacteria, fungi, insects, and mouse lymphoma cells. Of additional concern is the carcinogenic potential of formaldehyde in humans.

United Nations (1973). Report of the United Nations Conference on the Human Environment. United Nations; New York; 1973.

The declaration of the conference proclaims that both the natural and "man-made" environments are essential to people's well-being and to the enjoyment of basic human rights. The protection and improvement of the human environment is the duty of all governments. We must shape our actions with a more prudent care for their environmental consequences. Individuals, communities, enterprises, and institutions must accept equitable responsibility for the task. The report called for protection of non-renewable resources, the halting of the discharge of toxic substances and the release of heat in such quantities as to exceed the capacity of the environment to render them harmless, economic and social development for ensuring favourable living and working environments, integrated and coordinated approaches to development planning so as to ensure that development is compatible with the need to protect and improve environments, education in environmental matters for both young and old, scientific research and development in the context of environmental problems, and international cooperation to spare the earth the effects of nuclear weapons and all other means of mass destruction.

University of Michigan (1965). The Effect of Windowless Classrooms on Elementary School Children. Architectural Research Laboratory, Department of Architecture, the University of Michigan; 1965.

A study was made of windowless classrooms in elementary schools. Teachers like the absence of windows in teaching spaces because they prevent the students from being distracted by outside happenings and extra wall space can be put to good instructional use. Several professional educators, however, have questioned whether the elimination of outside distractions is always something to be desired — an exterior happening may frequently provide a fruitful stimulus to educational activity. Others contend that the curious child in a well-conducted classroom already has an information overload. Windows designed solely as eyes to the outside environment should be quite different in shape and size and location than the traditional window designs. Ideally, they should be ports or apertures in the building shell that will permit the building occupants to have a view of the outside in any desired direction at any desired time.

Unknown (1982). High Aspergillus Count in Hospitals Due to Construction and Renovation. Infectious Diseases, 14; April 1982.

Keywords: indoor air pollution; bacteria; construction; renovation;

Unknown (1982). Lung-cancer Increase Linked to Breathing Diesel-engine Fumes. Medical World News, pp. 22-24; April 26 1982.

> Heavy exposure to exhausts from diesel engines may raise American's lung-cancer risk by as much as 40%, according to Dr. Marc B. Schenker of Harvard University. A review was made of health records of 2,519 railroad workers. Men with the highest exposure to diesel fumes had a lung cancer rate nearly 40% higher than unexposed workers.

Unknown (1987). DOE Report Assesses Environmental Impact of Waste Oil Industry: Hazardous Waste News. International Journal of Air Pollution Control and Hazardous Waste Management, Vol. 37, No. 7, pp 780 - 781, 839 - 840; July, 1987.

> Many practices which have previously not been questioned as to their environmental or health impact are beginning to be examined. One such practice involves the disposal and re-use of waste oil. It is commonly applied to land, for example, as a road oil or dust suppressant, or is indiscriminately dumped. This creates the risk of contaminating air, water, and soil with substances that pose substantial hazards to humans, animals, and plant life. The hazardous nature of used oil is primarily related to the many contaminants which are known to have carcinogenic, mutagenics, teratogenic, and other chronic and acutely toxic properties.

Valciukas, Jose A.; Lilis, Ruth; Fischbein, Alf; Selikoff, I.J.; Eisinger, Josef; Blumberg, William E. (1978). Central Nervous Dysfunction Due to Lead Exposure. Science, Vol. 201, pp. 465-467; August 1978.

> Central nervous system dysfunction was investigated in workers at a secondary lead smelter by means of performance tests. Correlations between test scores and zinc protoporphyrin levels, a biological indicator of lead toxicity, are statistically significant. This correlation should prove to be useful in current efforts to evaluate effects of lead exposure.

Valciukas, Jose A.; Lilis, Ruth (1980). Psychometric Techniques in Environmental Research. Environmental Research, Vol. 21, pp. 275-297; Academic Press Inc.; 1980.

> Behavioral changes may be the earliest and only manifestation of neurotoxicity. Moreover, it is well known that extensive brain damage can occur with little or nondetectable clinical neurological deficit. Psychometric techniques now in use in toxicological and epidemiological research have been proposed to assess in an objective manner early manifestations of functional neurological changes that may be due to environmental neurotoxic agents.

Van Assendelft, A.; Forsen, K.-O.; Keskinen, Helena; Alanko, Kari (1979). Humidifier-associated Extrinsic Allergic Alveolitis. Scand. j. work environ. & health, No. 5, pp. 35-41; 1979.

> Keywords: allergic alveolitis; cool-mist humidifiers; Thermoactinomyces vulgaris; Aspergillus fumigatus; Amoeba proteus;

Van Rensburg, J.P.; Van Der Walt, W.H.; Van Der Linde, A.; Kielblock, A.J.; Strydom, N.B. (1982). Lead Absorption in Distance Runners Exposed to Motor Vehicle Exhaust Fumes. S.A. Journal for Research in Sport, Physical Education and Recreation, Vol. 5, No. 1, pp. 21-44; 1982.

> In order to establish the extent to which lead in exhaust fumes of motor vehicles is absorbed by athletes training along motorways, blood and urine samples of 94 distance runners from various regions in Johannesburg were analysed for lead and its derivatives. These results were compared with those obtained from a sedentary control group (n=122) and a group occupationally exposed to high levels of atmospheric lead (n=84). The above analyses were extended to erythrocyte count, haematocrit, haemoglobin and mean cell volume with regard to the runners and the sedentary control group. The mean whole blood level concentration of the distance runners was significantly elevated above that pertaining to the control group. In the absence of any irregularities in the haemopoietic pattern, it is suggested that these elevations do not constitute a short-term health hazard. In contrast, the industrial reference group exhibited significantly higher levels for all parameters. The overall impression is, therefore, that the airborne lead levels to which runners are exposed are not high enough to elicit any adverse biological effects. However, the fact that significantly higher whole blood lead levels were found in the runners, points to an "above average" exposure. The long-term or chronic effects of these "above average" levels are not known.

Vayda, Eugene (1986). The Canadian Health Care System: An Overview. Journal of Public Health Policy, pp 205 - 210; Summer 1986.

> An overview of the history and operation of the Canadian health care system is presented, with comparisons to the performance of the American system. Although the system has worked fairly well, there are concerns: that the system is rigid and inflexible, that costs may be poised to increase rapidly, and that a technology focus coupled with an oversupply of physicians and services may have produced a system which will be unable to adapt to the problems of an aging population, a post-industrial society, and changing human service needs. These concerns are healthy in that they may produce needed changes.

Visual Arts Ontario (1981). The State of the Art: Health Hazards, Conservation and New Materials For the Visual Artist. Visual Arts Ontario; November 1981.

> The objective of the conference is to make known the hazardous effects certain commonly used art materials can have and the precautions that should be exercised. Artists are among the highest sufferers of cancer, among other diseases, due to use of solvents, heavy metals, mineral dusts, gases, and other hazardous chemicals such as acids and alkalis. Adequate ventilation, proper use of protective equipment and basic safety equipment must become the concerns of art educators. Elementary, secondary and post secondary institutions must incorporate into their curriculum, health and safety programmes regarding the use of art materials.

Vogt, R.L.; Witherell, L.; Larue, D.; Klaucke, D.N. (1982). Acute Fluoride Poisoning Associated with an On-site Fluoridator in a Vermont USA Elementary School. American Journal of Public Health, Vol. 72, No. 10, pp. 1168-1169; 1982.

> On August 30 1980, an outbreak of minor illnesses consisting of nausea and vomiting affected 22 individuals attending a farmers' market at a school. Illness was associated with the consumption of beverages made from school water. Analysis of the water showed high levels of fluoride (1,041 mg/l). The most likely source of the contamination was the school fluoridator, which had accidentally been left on continuous operation.

Voronova, B.Z.; Elkovskaya, E.A. (1980). Effect of the Ventilation Regime on the Functional State of Young Schoolchildren. Gigiena I Sanitariya, No. 6, pp. 31-35; 1980.

> In model experiments, an appreciable improvement in air quality occured when the rate of air supply was increased to 40 or more cubic meters per hour per child, whereas the functional state of the children improved only when the air supply was increased to at least 60 cubic meters per hour per child. The functioning of different bodily systems did not improve simultaneously. The first to improve were the respiratory and cardiovascular functions, followed by that of the central nervous system.

Wadden, Richard A.; Scheff, Peter A. (1983). Indoor Air Pollution: Characterization, Prediction, and Control. John Wiley & Sons, Inc., Box 63, Somerset NJ 08873; 1983.

> This text is organized into four parts: characterization, prediction, control and application. The health implications, external and internal contributions, and the measurement of indoor air pollution are described. The current status of prediction techniques is outlined, including areas such as one-compartment models, infiltration estimation, and empirical models. The most common control methods are summarized:

filters, electronic air cleaners, gas filters and traps. Finally, the application of modeling techniques to several typical indoor settings is examined in detail.

In a course run by the authors in Ottawa in late April, 1985, and for which this publication served as a textbook, Messrs. Wadden and Scheff suggested that the samples of "Occupational Standards" which are discussed around Table 1.3 on page 5 of this publication are approximately ten times too high for an application to buildings to be used by a general cross-section of the population, while Table 7.1 on page 136 (ASHRAE) would lead to acceptable standards. The range of chemicals, covered by "Occupational Standards", however, is very extensive. The authors therefore suggest that that where no established ASHRAE standards exist, use should be made of the occupational standards, but divided by a factor of ten.

The Toronto Board of Education's Planner-Demographer has suggested in turn that the ASHRAE standard might be divided by ten to produce a "school-safe" standard, but this may be difficult to achieve in practice. Despite practical difficulties, however, it may be necessary to restrict the levels of known sensitizing chemicals to a small fraction of the occupational or ASHRAE standards (e.g. 1/100 or 1/1000).

Wadden, Richard A.; Scheff, Peter A. (1985). Estimation of Activated Carbon Requirements for Controlling Air Quality in an Art Workshop: Chapter 12 (Supplemental) to "Indoor Air Pollution: Characterization, Prediction, and Control" (John Wiley & Sons, Inc., Box 63, Somerset NJ 08873; 1983). Environmental and Occupational Health Sciences, School of Public Health, University of Illinois, Chicago, IL, USA. (treat as copyrighted material not to be distributed except by authors at this address)..

A variety of solvents and other potentially hazardous compounds are typically used in art workshops, including acetone, styrene, toluene, benzene, methyl cellulcse acetate, xylene, and others. Methyl cellulose acetate (MCA) was chosed as a representative paint and printing solvent. The authors demonstrate how activated carbon requirements for reducing indoor solvent odours may be estimated for several different control efficiencies.

Wales, Rosemary (1984). Residential Indoor Air Quality; Defining the Problems, Searching For Solutions. Habitat, Vol 27, NO. 1, 1984; Canada Mortgage and Housing Corp., Ottawa.

In recent years, as fuel prices have soared, making our houses increasingly airtight in order to conserve heat has let to an accompanying increase in indoor air pollution. Five of the most troublesome pollutants which can find their way into domestic air are; tobacco smoke, carbon monoxide, formaldehyde, radon, and particles of biological origin. The burning of fossil fuels and wood and the use of products derived from gas and oil can cause health problems. Chemical susceptibility varies from individual to individual and in the same individual according to age and physical condition. Chemical sensitivity problems related to housing are commonly the result of continuous, cumulative exposure, and often affect more than one bodily system at the same time.

Since current indoor air quality standards generally only apply to the industrial environment, there is a need to determine the safe limits of exposure to indoor air contaminants in living environments. There is also a need to determine the proportion of the population which is most adversely affected, and the groups which are most at risk. The role of government with respect to indoor air quality remains largely to be determined.

Walkinshaw, D.S.; Tsuchiya, Y.; Hoffmann, L (1987). Exploratory Field Studies of Total Volatile Organic Compound Concentrations in Relation to Sources and Ventilation Rates. ASHRAE; 1987.

Current interest in Total Volatile Organic Compounds (TVOCs) in the indoor environment has been stimulated by Molhave's (1986) postulate of a threshold for human sensory irritation to TVOCs at a concentration similar to those in some European buildings with complaints, and by several U.S. and European studies reporting indoor VOC exposures for many compounds that far exceeded outdoor exposures. The present study examined TVOCs and ventilation rates in eight Canadian settings: an office, an office/library, an office/laboratory, two schools, two hospitals, and a residence. VOCs were collected with a three-part sorbent sampler and then thermally desorbed, with TVOCs quantified by flame ionization detection and characterized by gas chromotography/mass spectrometry. Ventilation rates were estimated from carbon dioxide concentrations and building populations. On the basis of these techniques which were recently developed and are not yet standardized, TVOCs in some locations of four of the eight buildings were found at times to meet or exceed the levels of 2-5 mg/m 3 associated by Molhave with mucous membrane irritation and impaired ability to concentrate. However, the isoparaffinic hydrocarbons generated by liquid process photocopiers and identified as the primary TVOC constituent in the air of these four buildings, were well below their proposed occupational threshold limit value. Ventilation rates in all buildings but the schools greatly exceeded the minimum outdoor air proposed for the revised ASHRAE ventilation standard, although rates for the residence on occasion fell below the additional proposed minimum of 0.35 air changes per hour.

Waller, Julian A. (1978). Falls Among the Elderly—Human and Environmental Factors. Accid. Anal. & Prev., Vol. 10, pp. 21-33; 1978; Pergamon Press.

Keywords: falling accidents; elderly;

Wartew, G.A. (1983). The Health Hazards of Formaldehyde. Journal of Applied Toxicology, Vol. 3, No. 3, 1983.

Formaldehyde is common in the environment. As an aqueous solution, it causes burns on contact with the skin and eyes, and the vapour is irritating to the eyes and respiratory system. It is a sensitizing agent and may affect susceptible individuals at levels below the current British TLV of 2 ppm. It has been tested for teratogenicity in several animal species by a variety of routes, but was not positive in any of the studies. Inhalation of the vapour has been shown to cause nasal cancer in rats and mice. However, epidemiological studies have failed to confirm whether or not the compound is carcinogenic in humans.

Waterman, Fern K. (1984). Equilibrium of CO Between the Pregnant Mother and the Foetus. Occupational Health in Ontario, Vol. 5, No. 1, pp.10-22; January 1984.

The uptake of carbon monoxide by women and its relevance with respect to the foetus is discussed. No threshold can be established below which there is a margin of safety for the foetus.

Webber, Gerald M.B.; Clark, Alan J. (1979). Building Related Home Accidents: A Preliminary Study. Journal of Consumer Studies and Home Economics, No. 3, pp. 277-287; 1979.

Keywords: accidents; residential safety;

Weber-Tschopp, Annetta; Fischer, A.; Grandjean, E. (1976). Physiological and Irritating Effects of Indoor Air Pollution Due to Cigarette Smoke. Ergonomics, Vol. 19, No. 3, p. 377; May 1976; Taylor & Francis Ltd., London WC2B 5NF England.

Keywords: smoke; density measurement;

Weicker, Lowell P. Jr. (1986). Health Research and National Priorities. Journal of Medical Education, Vol. 61, pp 100 - 103; February, 1986.

The nation is in a critical period when national priorities have diverted resources away from the business of a better life and into the never-ending search for better destruction. A $6.5 billion appropriation for health research and $50 billion spent over 45 years is compared to a research budget for the Department of Defense in fiscal year 1986 of more than $40 billion. There needs to be an ordering of public priorities so that sufficient funds ensure a continuing research effort in the cause and prevention of diseases.

Weinstein, Malcolm S. (198?). Health in the City: Environmental and Behavioral Influences. Pergamon Press; 198?.

> Today's city has the potential to meet our physical needs better than ever before. Modern technology has been developed to assure clean water and effective sanitation services. But the prevalence of chronic diseases, accidents, and mental disorders has risen dramatically and it has a long way to go to promote the kinds of social environments and healthy lifestyles required to cut down on chronic diseases. Physical problems were given a great deal of early attention while the seeds of social and health problems resulting from overcrowding and poor housing were ignored. Today's health in the city reflects this early priority of physical over social needs. Health inspections need to include standards for social as well as physical environments. The most dehumanizing aspect of today's city is that, as a result of cars and mass transit, we have lost our freedom to move in a human scale. Cities must designed to meet people's basic spatial and personal needs.

Weiss, Bernard; Spyker, Joah M. (1974). Behavioral Implications of Prenatal and Early Postnatal Exposure to Chemical Pollutants. Pediatrics, Vol. 53, No. 5, Part II, pp. 851-856; May 1974.

> Some health effects caused by long term exposure to small levels of chemical pollutants may be represented as a slow processs similar to natural aging. It is extremely difficult to evaluate whether such differences are significant biological changes and whether they represent a potential for significant functional differences. The brain possesses an enormous reserve capacity. Still, a process that reduces this reserve capacity may, at some time later in life, because of additional losses, make the brain incapable of coping with any additional loads. Subtle neurological deficits and behavioral impairments are common developments of early exposure to lead. These handicaps are often not recognized until the child enters school when he or she exhibits a short attention span, hyperirritability and aggressiveness, sensory and motor impairments. Conventional neurological examinations often fail to detect such instances of minimal brain dysfunction.

Weiss, Bernard (1983). Behavioral Toxicology and Environmental Health Science: Opportunity and Challenge for Psychology. American Psychologist, pp. 1174-1187; American Psychological Association, Inc.; November 1983.

> Behavioral toxicology is now established as a component of the environmental health sciences. Its rise paralleled recognition that the adverse health impact of environmental chemicals should be gauged by how people feel and function, not solely by death or overt damage. Its compass extends across the total spectrum of environmental chemicals, including heavy metals, solvents, fuels, pesticides, air pollutants, and even food additives. Psychology can help resolve many critical issues in environmental health science and toxicology. Government agencies have to deter-

mine how to predict hazard to humans from animal testing, how to calculate risk on the basis of functional measures. Behavioral toxicologists must design adequate behavioral tests so that, for instance, behavior will be included in food additive testing protocols.

Werner, Carol M.; Altman, Irwin; Oxley, Diana (1985). Temporal Aspects of Homes: A Transactional Perspective. Home Environments, Human Behavior and Environment; Vol. 8; pp 1 - 32; Plenum Press; New York; 1985; Altman, Irwin and Werner, Carol M., editors.

> Homes can be viewed as transactional unities. Instead of researching and theorizing about the separate physical, psychological and interpersonal qualities of homes, this approach calls for an examination of homes as integrated unities of physical, psychological and temporal features. Concepts of social relationships need to be studied simultaneously; the home is defined by and gains meaning from the psychological and interpersonal events that occur in it.

Whiston Spirn, Anne (1984). The Granite Garden: Urban Nature and Human Design. Basic Books Inc./Harper Colophon Books; 1984.

> In order to create better, more habitable urban environments, it is necessary to understand the natural settings of cities — their air, water, geology, plant and animal life. Various factors of designing an urban ecosystem which works for its inhabitants are described in detail using examples from cities around the world.

White, Frederick A. (1983). Physiological and Psychological Effects of Sound. Our Acoustic Environment, chapter 17, pp 460 - 488; John Wiley & Sons; 1983.

> High sound levels can induce responses in the human body that are not specifically related to the auditory system. These physiological responses represent essentially a failure of the human organism to remain a passive system. In most instances, a physiological change is evident only during, or for a short time following, the noise exposure. Some effects studied include the effect of noise on blood circulation, the resistance of the skin to electrical potentials, skeletal-muscle tension, hearing, breathing, and the effect of noise on sleep. There is also evidence that noise effects the gastrointestinal tract, changes the size of the pupils of the eyes, and changes the rate of saliva and gastric secretions.
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> Psychological and sociological response to noise is difficult to quantify. Objective measurements can be made on specific work tasks, but many reactions to noise seem to be related more to personality factors than to specific noise conditions. A person's psychological response will also be conditioned by whether he or she feels that the noise is a highly personal infringement of a basic right to acoustic privacy. Other in-

fluencing factors are whether the noise is essential, the relationship of the noise to personal activity, the noise's predictability or unpredictability, and frequency of occurence. There is an aftereffect, especially to unpredictable noise.

An ideal accoustic environment would provide the most pleasant and efficient atmosphere for every individual to work, play or sleep. This is impossible when a large number of individuals are involved. A compromise is required between a rigid no-noise code and a societal attitude that is highly permissive. Advance planning and modern engineering methods can sometimes create strategies for noise reduction. For many years to come, the most complex problem will be the abatement of noise in the residential environment. Community planning of a long-range nature will be required to isolate residential from commercial and industrial areas. But in the final analysis, an individual's acoustic privacy will also depend upon good neighborliness and a genuine consideration for the acoustic sensibilities of others.

Wigle, Donald T.; Mao, Yang; and Grace, Michael (1980). Relative Importance of Smoking as a Risk Factor for Selected Cancers. Canadian Journal of Public Health, Vol. 71, July/August 1980, pp. 269-275.

To estimate the proportion of smoking-related cancers that might be prevented if persons did not smoke, a case-control study was performed using questionnaire data gathered from 3924 persons in Alberta who had developed cancer during the period 1971 to 1973. The population attributable risk percent by cancer site among persons who had ever smoked any type of tobacco was: lip: 44% for males; tongue, mouth and pharynx: 84% for males, 37% for females; esophagus: 67% for males; larynx: 84% for males; trachea, bronchus and lung: 88% for males, 52% for females; and bladder: 58% for males, 39% for females.

Wigle, D.T. (1982). Tobacco Smoke and the Non-smoker. Chronic Diseases in Canada, Vol. 3, No. 1, pp. 3-5; June 1982.

Keywords: tobacco smoke; passive smoking; indoor air pollution; health effects;

Wigle, D.T. (1982). Tobacco Smoke and the Non-Smoker. Chronic Diseases in Canada, Volume 3, No. 1, June 1982, pp. 5-8.

Some 37% of Canadian adults still smoke regularly. Any plan to reduce the extent of smoking must overcome at least two major obstacles. First, smoking is a powerful addiction with failure rates after cessation as high or higher than those for heroin addicts or alcoholics. Secondly, smoking is still socially acceptable (at the time of writing) or at least allowed in most areas. Thus, smokers do not receive enough negative feedback from non-smokers to have a major impact on the problem.

Wilde, Vicki L.; Glunt, Eric K. (1985). Intergenerational Housing: A report prepared for Phipps Houses pursuant to a study undertaken for the American Jewish Committee. City University of New York; January, 1985.

> In order to investigate options for meeting housing needs of both students and the elderly, the American Jewish Committee sponsored a study on intergenerational housing. The elderly, because they tend to live on low and fixed incomes, and students, because they choose to devote their time to academic and culturally but not economically productive work, share certain housing and support needs. A proposal was made to move graduate students into under-occupied or abandoned buildings in neighbourhoods with a high percentage of elderly people. The aim for the elderly would be to find housing options that are affordable, age-integrated, supportive of special needs, secure, and help them to remain in their current homes or neighbourhoods. A comprehensive bibliography is included.

Williams, D.L.; Muller, H.K.; Lugg, D.J. (1986). Cell-mediated Immunity in Healthy Adults in Antarctica and the SubAntarctic. J. Clin. Lab. Immunol., No. 20, pp. 43 - 49; 1986.

> Cell-mediated responses were studied in 2 Antarctic and sub-Antarctic groups at quarterly intervals over a wintering year, using the cutaneous CMI Multitest. The sub-Antarctic population had levels of responsiveness and hyoergy comparable to other healthy populations in temperate regions. The Antarctic group showed decreased scores and total number of positive responses to antigens, and a significantly elevated incidence of anergy and hypoergy. It is concluded that environment and stress factors in Antarctic expeditions are responsible for the decreased immunological responsiveness.

Williams, John S., Jr.; Leyman, Edward; Karp, Stephen A.; Wilson, Paul T. (1973). Environmental Pollution and Mental Health. Information Resources Press, Washington DC; 1973.

> This book brings together the existing literature on the subject of environmental pollution and mental health in a manner which provides a general overall view and suggests research priorities on the subject. Among the findings are that the ingestion of some pollutants such as lead, results in direct physical damage to brain tissue. Also discussed are mercury, carbon monoxide, organophosphorous compounds, chlorinated hydrocarbons, and noise pollution. Research priorities include the need for more complete information on the details of physiological effects; the need to explore the idea of mediators between environmental conditions and adverse mental health effects; details about the different kinds, intensities, and periods of exposure; the idiosyncratic nature of individual responses; the interactive effects of exposure to multiple pollutants; and refinement of the measurement of the mental health response.

Wilson, Richard (1978). Risks Caused by Low Levels of Pollution. Yale Journal of Biology and Medicine, No. 51, pp. 37-51; 1978.

Keywords: pollution; health hazards; risk factors;

Winkel, Gary H.; O'Hanlon, Timothy; Mussen, Irwin (1974). Black Families in White Neighborhoods: Experiences and Attitudes. City University of New York; May, 1974.

The increased physical diversification of the suburbs of large American cities during the past 25 years has not been matched by a corresponding diversification in the population residing there. Minority groups have experienced the most serious obstacles in gaining access to suburban living. This study describes the experiences of a group of sixty-two Black families who have purchased homes in racially-integrated suburban neighbourhoods. These people were affluent and well-educated with children who had moved from rental housing. The ease of locating a new home was made most difficult by inadequate information, various forms of racial discrimination from real estate brokers, sellers, neighbours of those selling, and occasionally from a bank. Once they had moved, families reported predominantly positive experiences with their new neighbors. Most of the families were not generally in favour of maintaining social class homogeneity in their new setting.

Winkel, Gary H.; Holahan, Charles J. (1985). The Environmental Psychology of the Hospital: Is the Cure Worse Than The Illness?. The Built Environment, pp 11 - 33; Haworth Press Inc.; 1985.

This paper presents a framework and summarizes evidence bearing on the role that the physical environment plays in the prevention and reduction of psychological and social problems encountered by patients in acute care and psychiatric institutions. Factors that are considered important to preventive strategies include issues such as the spatial layout and design of hospital environments, privacy problems, personal control and independence, information interventions, hospital social relationships, and levels of environmental stimulation. Two case studies are utilized to illustrate these issues within the context of both acute care and psychiatric facilities in a large municipal hospital. Greatest emphasis is placed on the use of the physical environment in the promotion of primary and secondary prevention within tertiary care settings.

Winkelstein, Warren, Jr.; Levin, Lynn L.; Johnson, Kathryn (1982). Health Effects of Particulate Pollution: Reappraising the Evidence. American Journal of Epidemiology, Vol. 115, No. 3, pp. 471-475; 1982; The Johns Hopkins University of Hygiene and Public Health.

Keywords: particulate pollution; lung diseases; particle size;

Witek, Theodore J.; Schachter, E. Neil; Colice, Gene; Beck, Gerald J.; Leaderer, Brian P.; Cain, William S. (1984). Characterization of Irritative Effects from Low-Dose SO2 Exposure: Sensory and Hyperreactivity Reactions to Sick Buildings; Berglund, Birgitta; Lindvall, Thomas; Sundell, Jan — editors. Indoor Air, Vol. 3, pp. 211-215; Swedish Council for Building Research, Stockholm Sweden, 1984.

> Sulfur dioxide (SO 2) is a known irritant that is commonly found in indoor air. The authors measured subjective respiratory complaints in asthmatics and healthy subjects during exposure to low levels of SO 2 in an environmental chamber. Asthmatics complained more of lower airway irritation such as wheezing and chest tightness while healthy persons noted more upper airway irritation such as taste and unusual odour. Exercise increased complaints in asthmatics, but not in healthy persons. In addition, it was demonstrated that there is a relationship between lung function changes and non-specific airway reactivity as assessed by methacholine challenge within the group of asthmatics, suggesting that in some asthmatics airway hyperresponsiveness contributes to the sensitivity to SO2.

Wolfe, Maxine (1976). Environmental Stimulation and Design; For the Different, Who Are Not So Different. Prepared for publication in Bednar, M.; Barriers in the Built Environment; Stroudsberg, PA: Dowden, Hutchinson & Ross, 1976.

> In designing for the developmentally disabled, we also must design for those parts of people or their daily lives that are not disabled. The environments we design, both socially and physically, can help to create disabilities. Research is described which focused on children in a large psychiatric facility. The facility was large in size, having been designed for almost 200 children, but was housing only a fraction of that number. The need to observe and physically contain a small number of children in a large space lead to the program's nature being changed from open and unstructured to highly structured and physically contained. It is suggested that the number of people in a space cannot be thought of separately from the size of the space and the location of areas within that space. The people who are affected by the environment which is being designed can effectively be included in the design process.
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> It was also found that in most residential treatment settings for the emotionally disturbed, one goal is to foster socially interactive behaviours among the children and between children and staff by means of programming which emphasizes group activities. Yet, one of the clearest findings in behavioural research, both inside and outside of institutions, is that increasing the number of people in a space decreases the amount of social interaction.

Wolfe, Maxine (1986). Institutional Settings and Children's Lives; An Historical, Developmental and Environmental Perspective on Educational Facilities. City University of New York Graduate School; 1986.

> A series of interdependent factors — physical, social, political, and economic, must be taken into account if we are understand people/ environmental relationships, for example the relationship between learning environments and the behaviours, attitudes, feelings, and development, both cognitive and social, of the children in them. For twelve years, the author and colleagues observed the use of space and educational practices in many schools which were of different vintages and philosophies. It was found that in most of these settings, what occured on a daily basis did not reflect the goals that teachers, administrators or designers said they were trying to achieve. She points out the institutional qualities which affect children such as structure and routine which take precedence over children as people; and control, authority and the accompanying surveillance which have the underlying assumption that in their absence children will be out of control and which create conformity and lack of privacy. Children are being taught to be passive rather than active creators of their own lives and experiences. Solutions include involving children in design and planning processes — creating alternative ways of creating environments so that the processes themselves will foster the healthy development of children.

Wolkenberg, R.C.; Gold, Calman; Tichauer, Erwin R. (1975). Delayed Effects of Acute Alcoholic Intoxication on Performance With Reference to Work Safety. Journal of Safety Research, Vol. 7, No. 3, pp 104-118; September 1975.

> An investigation was undertaken of the aftereffects of alcohol in a simulated industrial work situation. Nine male subjects were administered a series of tests, over a two-week period, that took place before, during, and after an evening of social drinking. Tests involved a variety of coordination requirements commonly required in industry and a questionnaire that measured subjective mood. Delayed effects were observed up to 18 hours after ingestion. These included lengthened reaction time, poor motor performance, and decreased motor sensory skill, as well as inability to manipulate and position without tactile and/or visual facilitation. Some of these and other effects noted could create safety and health problems in a work situation.

Wood, Ronald W. (1981). Neurobehavioral Toxicity of Carbon Disulfide. Neurobehavioral Toxicology and Teratology, Vol. 3, pp. 397-405; 1981; Ankho International Inc.

> Keywords: carbon disulfide; behavior; toxicity; central nervous system; peripheral nervous system;

World Commission on Environment and Development (1987). Our Common Future. Oxford University Press, New York NY; 1987.

> The World Commission on Environment and Development, headed by Gro Harlem Brundtland, Prime Minister of Norway, was set up as an independent body in 1983 by the United Nations to re-examine the critical environmental and development problems on the planet and to formulate realistic proposals to solve them. This book concludes that the time has come for a marriage of economy and ecology, so that governments and their citizens can take responsibility not just for environmental damage, but for the policies that cause the damage.

World Health Organization (1979). Health Aspects of Wellbeing in Working Places: Report on a WHO Working Group/EURO Reports and Studies. World Health Organization, Regional Office for Europe, Copenhagen Denmark; 1980.

> Keywords: occupational health; indoor air pollution; workplace hazards;

World Health Organization (1979). Health Aspects Related to Indoor Air Quality: Report on a WHO Working Group/EURO Reports and Studies. World Health Organization, Regional Office for Europe, Copenhagen Denmark; 1979.

> The health aspects of indoor air quality were reviewed by a Working Group convened by WHO in collaboration with the Government of the Netherlands. It was recognized that indoor air quality depended on a number of factors operating simultaneously; these were examined separately and in relation to each other. Pollutants generated outdoors, such as sulphur oxides, nitrogen oxides and carbon monoxide particulates, photochemical oxidants and biologically active particulates, and their relationship to the indoor environment were discussed. A number of pollutants released from indoor sources were identified, such as formaldehyde from particleboard and foamed insulation, radon from the soil or building materials, and fibres of asbestos. Indoor generation of nitrogen oxides, carbon monoxide, carbon dioxide, water vapour and particulates, through human physiological processes or use of unvented gas burning appliances, was also considered.

World Health Organization (1982). Legionnaires' Disease: Report on a WHO Working Group/EURO Reports and Studies #72. World Health Organization, Regional Office for Europe, Scherfigsvej 8, DK-2100 Copenhagen Ø Denmark; 1983.

> A meeting of the Working Group was convened by the WHO Regional Office for Europe in collaboration with the Austrian Government. Legionnaires' disease, a multisystem disease with pneumonia as the principal clinical feature, acquired its name following the mysterious outbreak among people attending an American legion convention in Philadelphia in July 1976. In January 1977, a previously unrecognized bacterium was shown to be the

agent responsible for the Philadelphia outbreak. The bacterium was named Legionella pneumophila and is now known to be a member of a large family of Legionellaceae. Dramatic common-source outbreaks have occurred in hotels, hospitals, and other establishments in association with contaminated water systems.

World Health Organization (1983). Indoor Air Pollutants: Exposure and Health Effects: Report on a WHO Working Group/EURO Reports and Studies #78. World Health Organization, Regional Office for Europe, Scherfigsvej 8, DK-2100 Copenhagen Ø Denmark; 1983.

The assessment and monitoring aspects of exposure to indoor air pollutants were reviewed by a Working Group convened by the WHO Regional Office for Europe in collaboration with the Government of the Federal Republic of Germany. The purpose of the meeting was to review prior work and work underway, and to evaluate the extent to which such work is likely to provide early estimates of actual population exposures and the extent of the health impacts associated with them. Nine main aspects discussed were: population exposure, adverse health effects, concentration values, existing standards, international steering committee on indoor air quality, exposure assessment and priorities, sick building syndrome, sulphur dioxide concentrations and indoor/outdoor relationships, and health effects assessment methodologies and priorities.

World Health Organization (1983). Health and the Environment: Report on a WHO Meeting. World Health Organization, Regional Office for Europe; 1983.

A working group met to discuss how to put strategy into operation aimed at attaining health for all by the year 2000, with prevention, including environmental factors, being an important element. Recommendations include improving and organizing the data base on environmental health, especially in terms of linkages between morbidity/mortality data and environmental exposure; developing national environmental health policies aimed at prevention; developing more comprehensive and standardized risk assessment processes which take into account economic, social, and other factors; conducting research in the biological sciences with emphasis on individual sensitivities and the identification of defence mechanisms against toxic substances that contribute to ill health; and strengthening the components of environmental health in medical training. Public agencies should be encouraged to inform the public about comparative risks and the risks of individual hazards.

World Health Organization (1983). Health Impact of Different Energy Sources: A Challenge for the End of the Century. World Health Organization, Regional Office for Europe; July, 1983.

Current patterns of energy use were reviewed and trends estimated in the use of fossil and nuclear fuels and alternative sources of energy.

The adverse effects on health of different fuel cycles as well as conservation were analyzed. The number and severity of problems of the various sources increases from water, gas and the sun, to oil, nuclear energy, and coal. There are many gaps in knowledge. Sound and cost-effective studies should be made of the effects of energy-related toxicants on people, and on animals in experiments, to reduce current uncertainties about the nature and magnitude of the effects on health. Expanded research should be done to determine exactly how people and the environment are exposed to emissions. The capacity of large atmospheric and aquatic ecosystems to receive pollution should be determined. Research should be done on the genetic and teratogenic effects of energy-related pollutants and the conditions in which people are exposed to them.

World Health Organization (1984). The Effects of the Indoor Housing Climate on the Health of the Elderly: Report on a WHO Working Group. World Health Organization, Regional Office for Europe, Scherfigsvej 8, DK-2100 Copenhagen Ø Denmark; 1984.

A meeting of the Working Group on Indoor Housing Climate Impact on the Health of the Elderly was convened by the WHO Regional Office for Europe in collaboration with the Austrian Government. There has been increasing concern about the effects of the indoor climate of housing on people's health, especially those who may be considered to be at high risk, such as the elderly, the handicapped, and young children. These high-risk groups tend to spend more time at home than do other groups of people and apparently tend, for one reason or another, to be more sensitive or more reactive to extremes in indoor climatic conditions. There is concern not only among health specialists about the possible relationship between reduced ambient air temperatures and rates of ventilation in housing and respiratory diseases. U.S. research cited in the report indicated that indoor airborne viruses and bacteria were the most important causes of disabling illness in that country.

World Health Organization (1984). Summary Report: Working Group on Indoor Air Quality Research: Report on a WHO Working Group. World Health Organization, Regional Office for Europe, Scherfigsvej 8, DK-2100 Copenhagen Ø Denmark; 23 October 1984.

A meeting of the Working Group on Indoor Air Quality Research was convened by the WHO Regional Office for Europe immediately following the Third International Conference on Indoor Air Quality and Climate in Stockholm, Sweden in August, 1984. The Group noted an increased interest in, but little corresponding progress in the determination or estimation of, the overall impact on public health of different pollutants identified in the indoor environment. The Group concluded that changes in building design and engineering practices can have serious consequences for air quality, and that when such changes are introduced, followup studies on the occupants perceptions, reactions, comfort and health should be carried out. Among other things, the

Group also cited indications that the proportion of allergic or hypersensitive individuals in the population is increasing. They recommended that research be initiated into the possible contribution of poor indoor air quality to the causation of allergy and hyperreactivity, and to the frequency and severity of the responses. Special environmental requirements for the protection of the affected groups should be assessed.

World Health Organization (1986). Intersectoral Action for Health: The Role of Intersectoral Cooperation in National Strategies for Health for All. World Health Organization; 1986.

Intersectoral cooperation has been accepted as one of the guiding principles of an international health strategy. Equity in health cannot be achieved by the health sector alone. It requires contributions from many sectors, in particular agriculture, animal husbandry, food, industry, education, housing, public works, and communications. The health sector has a vital interest in promoting equity-oriented educational policies that give priority to resources for primary education, and pay special attention to the health-related problems of women. Collaboration between health and education can best take place in the school setting. Health education has to be specifically targeted to the different vulnerable population groups. The link between housing and health has been relatively neglected in health strategies but is a major contributory cause of ill health. The health sector also needs to participate in surveillance and safeguards in the area of industrially-generated health hazards. Community participation has been identified as an important means of overcoming sectoral barriers. The priority for health in the national allocation of resources has to reflect the priority accorded to health as a goal.

Wotton, Ernest (1981). Lighting For Education. Ontario Ministry of Education; 1981AD -.

This booklet considers some of the qualities and quantities that must be dealt with to produce good lighting for education. Such things as distracting hum from fluorescent light ballasts is dealt with. Fluorescent lighting's possible effect on hyperactive children is discounted due to lack of conclusive data. It is suggested that students working under fluorescent lighting with very good colour rendering become less visually fatigued than those working under some other forms of fluorescent lighting.

Wotton, Ernest (1982). An Investigation of the Effects of Windows and Lighting in Offices. Health Facilities Design, Department of National Health and Welfare, Ottawa, Canada; May 1982.

This paper presents the results of a study of the effects of windows and lighting on the performance and well-being of office workers. Data was collected by means of structured interviews with 235 managerial and clerical staff in 6 office buildings in southern Ontario. The buildings had a range of window glazing from 11% to 68%. The respondents had desk locations both near and far from a window. Light meter readings were also taken. No strong relationship was found between work productivity and access to daylight, between work productivity and percentage of glazing, or between job satisfaction and office lighting. Subjective perceptions of bright and dim daylight/electric light do seem to be related to the occurrence of headaches and eyestrain, and to mental well-being. While adequate lighting and access to a window are identified by office workers as important to them, the size of the window and the clearness of the view seem to be relatively unimportant. Within the range studied here, if office lighting is particularly low or high, it can have negative effects on the physical health of workers. However, mental well-being is not so dependent on objectively optimum lighting conditions than on how that lighting is perceived subjectively by workers. An extensive bibliography is included.

Wright, Michael; Killan, D. Jack (1979). Panel Discussion: Role of the Knowledge of High Risk Groups in Occupational Health Policies and Practices. Environmental Health Perspectives, Vol. 29, pp. 143-153; 1979.

When setting out occupational health policies and practices, industry, while being aware of the risks to susceptible workers, must also recognize that there may be dangers to the health of so-called non-susceptible workers as well. Reducing environmental exposure may be the most appropriate solution to the risk problem and cigarette smoking is also a hypersusceptibility factor that must be considered.

Yang, William H.; Purchase, Emerson C.R. (1985). Adverse Reactions to Sulfites. Can Med Assoc Journal, Vol 133, pp 865 - 867, 880; November 1985.

Sulfites are widely used as preservatives in the food and pharmaceutical industries. In the United States more than 250 cases of sulfite-related adverse reactions, including anaphylactic shock, asthmatic attacks, urticaria and angioedema, nausea, abdominal pain and diarrhea, seizures and death, have been reported, including 6 deaths allegedly associated with restaurant food containing sulfites. In Canada 10 sulfite-related adverse reactions have been documented, and 1 death suspected to be sulfite-related has occured. The exact mechanism of sulfite-induced reactions is unknown. Practising physicians should be aware of the clinical manifestations of sulfite-related adverse reactions as well as which foods and pharmaceuticals contain sulfites. Cases should be reported to health officials and proper advice given to the victims to prevent further exposure. The food industry, including beer and wine manufacturers, and the pharmaceutical industry should consider using alternative preservatives. In the interim, they should list any sulfites in their products.

Yassi, Annalee (1982). Occupational Disease and Workers' Compensation in Ontario. Ontario Ministry of Labour; 1982.

> While occupational disease is not a newly uncovered problem, its potential magnitude has only recently been widely recognized. The increasing awareness has led to pressure for regulating industrial health hazards and to efforts for cleaning up the workplace. This report addresses the scope of occupational diseases under the headings of physical agents, biological hazards, chemical agents, ergonomic factors, and psychosocial stress. Measuring occupational disease is a difficult task. The various approaches to determining the work-relatedness of disease and decision-making frameworks for compensating victims in Ontario, Canada, the U.S., and Europe are examined. Cancer, respiratory disease, and work-related death are all examined in extensive detail. Recommendations are made concerning compensation policy and procedure in Ontario as well as on external matters.
>
> Industrial disease is under-compensated. Many work-related diseases are not likely to be diagnosed as such because physicians lack awareness of occupational hazards and often neglect to take a comprehensive occupational history. Cases of occupational disease are under-reported because of the absence of records needed to alert workers and their physicians to the possible role of workplace factors in disease. Claims for potentially work-related diseases are almost systematically rejected in the absence of strong supportive research. There is therefore a need for greater resource allocation to research into industrial disease, possibly via a single research agency entrusted with the responsibility of conducting needed studies in industrial disease both for purposes of compensation and prevention. The establishment of a system of independent occupational health clinics would also facilitate the recognition and reporting of occupational disease.

Yocom, J.E. (1983). Industrial Sources of Metals. NeuroToxicology, Vol. 4, No. 3, pp. 91-102; 1983.

> Any industrial process utilizing or producing inorganic materials releases metals (usually in the form of oxides or salts) into the environment. Metals and compounds containing metals may also be released from industrial processes based on organic materials where metals are used in the process. Significant quantities of metals are released from incinerators burning industrial and municipal waste. Metals are also released from combustion sources such as fuel burning for heat and power (including cars). Selected data is presented from the published literature on atmospheric emission of metals from several heavy industry categories and from incinerators.

Yoshida, Ken (1984). Review of Research Projects. unpublished.

> This is a review of Dr. Yoshida's research projects undertaken on pesticides in environment, aerosol science, air pollution and industrial hygiene at the Saskatchewan Research Council and University of Saskatchewan, College of Medicine, since 1967. Projects include Board of Education sponsored studies of air pollution and health at elementary schools.

Yoshida, Ryo; Motomiya, Ken; Saito, Hiroyasu; Funabashi, Shigeru (1976). Clinical and Epidemiological Studies on Childhood Asthma in Air Polluted Areas in Japan. from Clinical Implications of Air Pollution Research, Finkel and Duel, editors; Chapter 13, pp. 165-176; Publishing Sciences Group, Inc.; 1976.

> In recent years, the prevalence rate of bronchial asthma in schoolchildren has been on the increase in Japan, and the rates in air polluted areas are higher than the rates in unpolluted areas. It has also been shown that the clinical findings in the air polluted areas are not fundamentally different from those in the unpolluted areas, and that bronchial asthma in the air polluted areas originates in allergic reactions. For symptomatic treatment of children with bronchial asthma in the air polluted areas, it is necessary to quarantine them from air-polluting substances by use of a dust-free room, but it is also fundamental to institute hyposensitization therapy by a positive study on antigens.

Young, G. Stewart; Hagopian; John H.; Hoyle, E. Robinson (1981). Potential Health Effects of Residential Energy Conservation Measures: Final Report, February 1980-February 1981. US Govt.; NTIS PB82-133315; July 1981.

> Keywords: residential buildings; ventilation; energy conservation; indoor air pollution; NHW

Yulsman, Tom (1985). The New Threat From PCBs: Special Report: We've Brought The Poisons of a Waste Dump into the Office. Science Digest, pp. 66-68, 84; February 1985.

> In 1981 an electrical fire in the basement of an 18 story New York state office building created an indoor environmental disaster. Oil containing PCBs spilled into the blaze and was changed by the heat into a dangerous brew containing, among other substances, dioxin. Contaminated soot was dispersed throughout the building by the ventilation system. Such fires have become fairly common, exposing large numbers of people to reproductory system damage, immune system damage, cancer-causing agents.

Zamm, Alfred V.; Gannon, Robert (1980). Why Your House May Endanger Your Health. Simon & Schuster, New York NY, 1980.

There are many environmental problems within buildings: chemical pollution, poisonous vapours, electrical particles, electromagnetic waves, dust, fumes from waxes and disinfectants. Hyperactivity, respiratory and digestive upsets, skin rashes, even symptoms of mental retardation can result from the presence of noxious chemicals indoors.

Zube, Ervin H. (1984). Environmental Evaluation: Environment and Behavior Series. Cambridge University Press; 1984.

Evaluation studies are intended to provide information to improve the quality of decision making with reference to environmental management as well as to change and modification. Whenever growth occurs, modification of the environment will occur, sometimes under the jurisdication of federal or local policies relating to housing, recreation, transportation, etc. Evaluation studies provide a means for assessing the suitability of those policies through studying the success or failure of the subdivisions, apartments, parks, playground, and subway stations that result from their implementation. Three stages are important for assessment: the inventory or evaluation of existing environments, consideration of alternatives, and after the plan is implemented, the design or management program which evaluates the modified environment.

Zuckerman, Diana M.; Zuckerman, Barry S. (1985). Television's Impact on Children. Pediatrics, Vol. 75, No. 2, pp 233 - 240; February 1985.

Television has a major impact on children's knowledge, attitudes and behaviour. Research has demonstrated the association between television viewing and four areas: children's aggressive behaviour; racial and sex-role stereotypes; decreased interest in reading and school activities; and poorer health habits and attitudes. Methodological limitations make it difficult to draw firm conclusions about a causal relationship between television viewing and children's behaviour. Representative studies in these four areas are reviewed, important methodological concerns are pointed out, and conclusions from the research findings are drawn. The implications of the data for pediatricians and other health professionals are discussed. The modest statistical associations between television viewing and children's cognitive or behavioural problems may be masking the more extreme responses of small groups of especially vulnerable children. The identification of a high-risk subsample of children has been virtually ignored in the research that has been conducted thus far.

Zweideinger, Ruth A. (1977). Organic Emissions from Automobile Interiors: Final Task Report, July 1975 to January 1976. US Govt.; December 1977.

Keywords: volatile organic compounds; automobile interiors; vinyl chloride; gas chromatography; mass spectroscopy; monomers;

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